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Twelfth Report

OF THE

Bureau of

Agriculture, Labor and Industry

OF THE

State of Montana

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FOR THE YEARS 1909 and 1910

PART I

Agriculture and Industry

J. H. HALL, Commissioner.

"INDEPENDENT PUBLISHING COMPANY, HELENA, MONTANA."

STATE OF MONTANA.
BUREAU OF AGRICULTURE, LABOR AND INDUSTRY.

Helena, Montana, December 1, 1910.

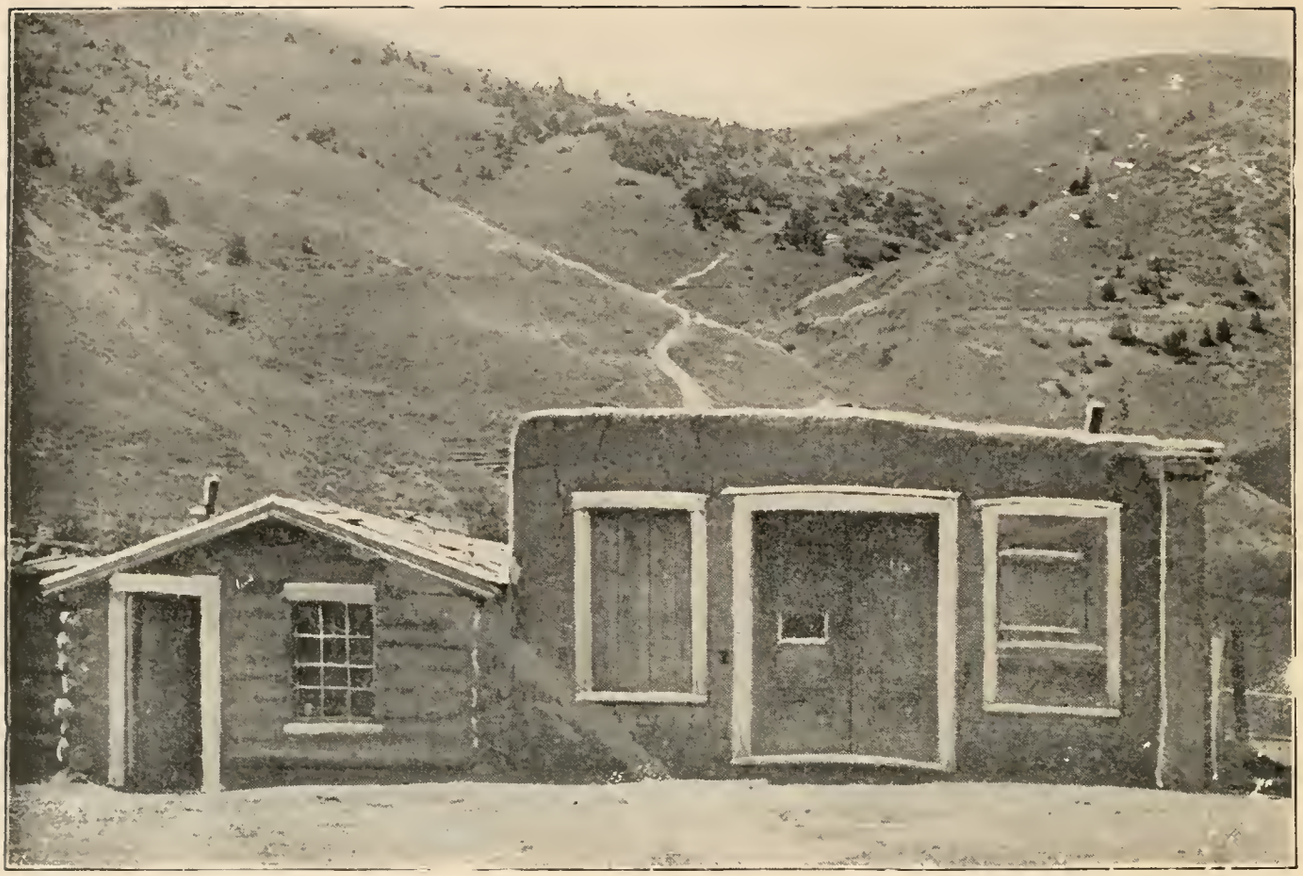
To His Excellency,
EDWIN L. NORRIS,
Governor of Montana.

Sir: I have the honor to transmit herewith Part 1 of the Twelfth Report of the Bureau of Agriculture, Labor and Industry of the State of Montana for the years 1909 and 1910, relating to Agriculture and Industry.

While this is the Twelfth Report of the Bureau it is also the Sixth Biennial Report. Previous to 1900 the reports were made annually.

Very respectfully,

J. H. HALL,
Commissioner.



House at Bannack where the First Legislature Met.

First Territorial Capitol, Virginia City.

State Capitol, Helena.

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INTRODUCTION.

The two years that have passed since the publication of the last biennial report of this bureau have been years of extraordinary development in Montana.

It has been a period of awakening to a realization of the wonderful agricultural resources of the state. Inside and outside the state people have begun to realize that Montana is an empire of rich farming lands which when cultivated will make the annual yields from farms inferior only to those of a few of the most favored states. The only reason Montana is not now among the leading states in value of crops produced is because so few of its fertile acres are cultivated.

The knowledge that millions of acres of the most productive land in America were lying here untilled, awaiting settlers, has spread throughout the United States and into foreign countries. Many agencies have combined to make known the advantages Montana offers to the homeseeker. The publicity work of this bureau has directly influenced many thousands. Commercial clubs and boards of trade in nearly every town and city have published and circulated literature that have drawn to the state settlers in great numbers. The newspapers of Montana with scarcely an exception have been persistent in calling attention to the advantages the state offers to the homeseeker. Private letters from settlers to friends and relatives recounting their expriences and relating their successes have been potent agencies in inducing immigration. Newspapers and magazines published outside the state have devoted columns of valuable space to describing what to them is a newly discovered empire of fertile lands.

In cost and extent of operations and in results attained the various railroads which traverse the state have far surpassed all other agencies in giving publicity to Montana's advantages as a farming region. Not only have they circulated quantities of literature intending to attract immigrants but they have collected and placed in exhibition halls in large cities samples of the products of Montana's soil and have hired well informed men to present and answer such inquiries as prospective settlers might make as to climatic conditions, methods of cultivation and other related matters. Also they have in sense, taken Montana to show to Easterners rather than wait for them to come see it, by taking from place to place cars of Montana's products with literature and lecturers to meet all questions. By these means millions of persons have been informed of the wonderful productiveness of the soil of Montana.

The actual facts as reported by the United States Department of Agriculture have constituted the most effective advertisement. Montana's supremacy is demonstrated by the following table to which this bureau has given wide publicity.

MONTANA AS AN AGRICULTURAL STATE.

Comparative Yields for 1909 Compiled from the Government Crop Reporter Published by the Secretary of Agriculture, December, 1909.

STATE	Bu. per Acre Wheat	Bu. per Acre Oats	Bu. per Acre Barley	Bu. per Acre Rye	Bu. per Acre Flax	Tons per Acre Hay	Bu. per Acre Potatoes
Montana	30.6	51.3	38.0	29.0	12.0	1.79	180
Illinois	17.4	36.6	28.0	17.8	....	1.45	91
Iowa	18.1	27.0	22.0	17.8	9.8	1.64	89
Missouri	14.7	27.0	25.0	15.0	8.1	1.35	85
Nebraska	16.7	25.0	22.0	16.5	8.5	1.50	78
Kansas	13.0	28.2	18.0	14.2	7.0	1.45	79
Minnesota	16.8	33.0	23.6	19.0	10.0	1.75	115
Wisconsin	19.7	35.0	28.0	16.3	14.5	1.53	102
Michigan	18.8	30.5	24.7	15.5	....	1.30	105
Indiana	15.3	30.5	28.5	16.5	....	1.40	95
Ohio	15.9	32.5	25.9	17.2	....	1.43	93
North Dakota..	13.7	32.0	21.0	18.3	9.3	1.37	110
South Dakota..	14.1	30.0	19.5	17.5	9.4	1.50	80
United States..	15.8	30.3	24.3	16.1	9.4	1.42	106

A large increase in the acreage of crops is shown for 1910 over 1909, which promises to be doubled next year or the year following as settlers have been pouring into the state by thousands in the past two years. In the fiscal year ending June 30, 1910, all records for the disposition of agricultural lands to homesteaders were beaten by the Montana land offices.

The acreage in wheat increased from 350,000 to 480,000; in oats, from 300,000 to 350,000; all other crops showed increased acreage, but the greatest was in flax, which leaped from 10,000 acres to 60,000.

The year 1910 was one of unusual drouth in Alberta, Manitoba and the great grain growing states of this country. Montana did not entirely escape, the condition of the wheat crop on July 1 being six below normal as against forty-eight below normal in North Dakota, but under the adverse circumstances of a dry year and a large area planted for the first time, established its right to be classed as an agricultural region of remarkable productiveness.

The following table explains itself:

Comparative yields for 1910, compiled from the Government Crop Reporter, published by the Secretary of Agriculture, December, 1910.

	Bushels Per Acre.						Tons per Acre.	
State.	Winter Wheat.	Spring Wheat.	Oats.	Barley.	Flax Seed.	Corn.	Potatoes.	Hay.
Iowa	21.2	20.9	37.8	29.5	12.2	36.3	72	1.05
Kansas	14.2	....	33.3	18.0	8.2	19.0	57	1.15
Minnesota	....	16.0	28.7	21.0	7.5	32.7	61	1.00
Missouri	13.8	....	33.6	27.0	8.4	33.0	86	1.30
Nebraska	16.5	13.9	28.0	18.5	8.0	25.8	60	1.00
North Dakota..	....	5.0	7.0	5.5	3.6	14.0	41	.55
South Dakota..	....	12.8	23.0	18.2	5.0	25.0	44	.80
United States..	15.8	11.7	31.9	22.4	4.8	27.4	94.4	1.33
Montana	22.0	22.0	38.0	28.0	7.0	23.0	120	1.40

As a result of the widespread publicity which has been given to Montana in the past two years it has been estimated that one hundred thousand new comers have made their homes in the state.

The extent of this movement of population may be gauged, in a measure, by the number of entries of public land which have been made in the local land offices.

The most important event in the industrial history of the state in the period mentioned was the completion and opening to operation of the line of the Chicago, Milwaukee and Puget Sound Railway across Montana. This extension of the Chicago, Milwaukee and St. Paul railroad system enters Montana at Montline, Custer County, and leaves the state at East Portal, Missoula County, a distance of nearly 750 miles. The building of this railroad opened up a vast and fertile country that had been devoted to grazing and has been followed by a great influx of settlers who have turned thousands of acres of the prairie into farms. Prosperous towns and small cities have sprung up along the route where formerly was a vacant prairie or only a small settlement. Miles City has experienced a phenomenal growth as a consequence of the coming of the railroad. Harlowton has increased in population and business, and Deer Lodge and Missoula have been materially benefited. Three Forks, near the old village of the same name, is a flourishing new town which owes its existence to this road. Roundup on the border of Fergus and Yellowstone counties is the seat of important coal mines which have recently been developed and the supply point for a large territory which is rapidly developing. At short intervals along the whole line are new towns which are supply points for adjacent territory, their existence furnishing evidence of the rapidity with which the country is changing from a grazing to a farming region.

In 1909 the first section of an interurban electric railroad to be started in Montana was completed in Gallatin County; and in 1910 the road was extended to Three Forks to connect with the Chicago, Milwaukee and Puget Sound Railway which has acquired ownership of the original road. The electric road traverses the Gallatin Valley, allows farmers to load farm products on cars without long hauls, affords convenient and easy means of travel to school, church and town, lessens the isolation of life on the farm and is the pioneer of many similar roads that will be built in the more populous parts of Montana. Also it has brought a new transcontinental line into Bozeman and stirred the competing line to providing better terminal facilities.

White Sulphur Springs, the county seat of Meagher County, an old and attractive town where are located wonderful mineral springs, was placed in railroad communication with the world in November, 1910, when cars entered it over the tracks of the Yellowstone Park and White Sulphur Springs Railroad. This road may in time become a part of the Milwaukee system, and its construction marks the beginning of the development of the town into a great health resort.

Rumors of an intention of the Milwaukee ssytem to build a branch

into the Yellowstone National Park have been rife, but no announcement on the subject has been made by the company.

The inflow of population is shown conspicuously in the increase of business and the growth of the towns along the lines of the Northern Pacific and Great Northern Railways. The vast prairies of Eastern Montana for some distance from the railroads have become the homes of thousands of new settlers. The Judith Basin has been transformed from a vast pasture to a most productive farming region. New towns have sprung up as if by magic and the presence of grain elevators shows that they are the results of the new agricultural development.

The construction of the Billings and Northern division of the Great Northern only a few years ago afforded a second route through Montana to the Pacific Coast for trains of the Burlington system and opened up for farming millions of acres of fertile lands. The country along the line has filled with settlers and has developed into one of the most productive farming regions in the United States.

In the northeastern corner of the State, in Valley County, the Great Northern has built a branch to Plentywood and that section has settled up rapidly.

The Pittsburg and Gilmore Railroad Company has built and is now operating a line from Armstead in Beaverhead County to Salmon City in Idaho. Something of mystery attaches to this road which has been supposed by some to be the beginning of a new trunk line and by others an important cut-off for one of the great railroad systems which now crosses Montana and reaches the Pacific Coast.

The development of the agricultural resources of Montana will be hastened if certain extensions of the Northern Pacific, the Great Northern and the Milwaukee of which announcements have been made with a certain degree of definiteness and authority, shall be made. The Great Northern is to build from a point near Mondak on its main line through Dawson and Fergus Counties, passing through Lewistown, to Meagher on the Billings and Northern. The Northern Pacific is to build from Glendive through Dawson and Fergus ounties to Meagher. From Meagher both roads are to construct a line jointly through White Sulphur Springs to Helena. While the routes of these extensions have not been definitely made public there is strong probability that the projects will become a reality.

There is also a likelihood that the Great Northern will build through the Flathead Reservation a line which will connect its line at Kalispell or vicinity with the Northern Pacific at or near Dixon. This North and South line will afford needed railway facilities to settlers in the newly opened Flathead Reservation and bring Flathead and Lincoln counties into closer relations with the principal cities of Montana.

From Glendive an extension of the Northern Pacific has been built down the Yellowstone River to Sidney giving railway facilities to the lands embraced in the Lower Yellowstone Reclamation project. Into the Shields River Valley, a productive agricultural section in Park County,

the Northern Pacific has built a branch line which at present terminates at Wilsall, twenty-six miles from Livingston. It seems likely also that the Northern Pacific will have a road through the Lolo Pass before long.

For several years there has been talk of building a line that would enable the Burlington to save distance in making connection with the Billings and Northern at Laurel and there is probability that the gap between Bridger and Frannie will soon be filled.

The Montana Western Railway is a new road nineteen miles long extending from Valier, the principal town in the lands reclaimed by the Conrad Land and Irrigation Company, to Conrad on the Shelby branch of the Great Northern Railway.

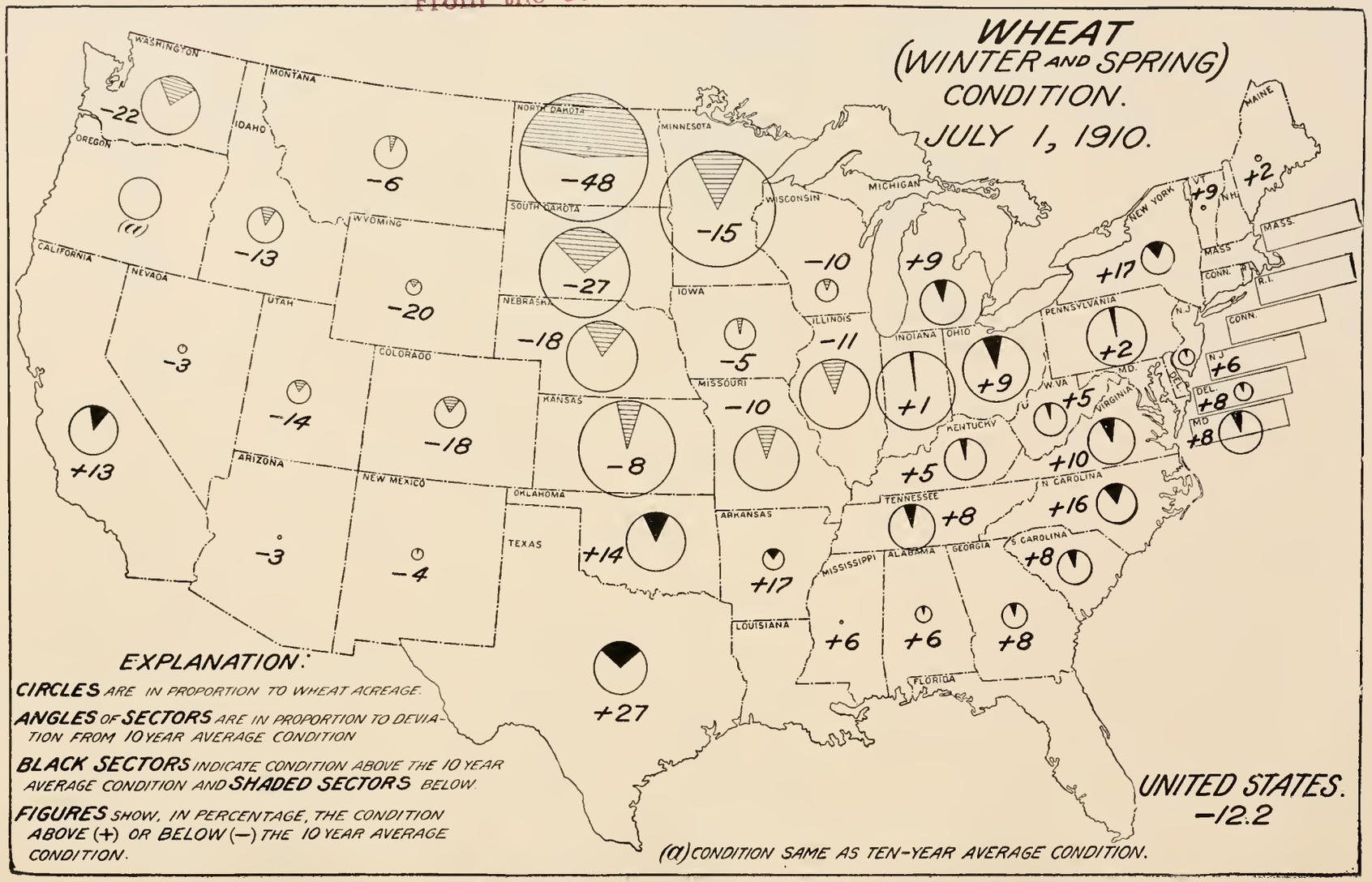
The Milwaukee road also, it is reported, has made surveys and expects soon to make extensions of lines. From the Musselshell country it is to build into Lewistown and perhaps north into Great Falls. Probably the plan is to cross the main range and connect at some point on the Blackfoot River with the line of the Big Blackfoot Railroad Company, which is believed to be a part of the Milwaukee system. Applications recently made for rights of way through state lands confirm this supposition.

Map and profiles of the branch the Milwaukee intends to build from the Blackfoot Valley into the Flathead Valley and thence north into Canada were recently filed in the United States Land Office at Kalispell. The route begins at Clearwater, Powell County, running down Swan River to Swan Lake and thence eastward of the town of Big Fork, along the east side of the Flathead River to a point near Creston where it turns and runs in a western direction, crossing the Flathead River east of Kalispell and approaching the city on the wide flat adjoining it on the east. From Kalispell the route is northward to the north fork of Flathead River, which it follows to the international boundary line.

No authoritative information can be obtained from railroad officials as to their plans and these extensions may not be built. If they are constructed the effect will be to cause the settlement upon, and cultivation of, many million acres of farm lands which are now untilled because of the lack of transportation facilities. Also they will make available timber tracts which are now too remote from railroads to be utilized. In Eastern Montana are great coal fields which cannot be developed until transportation by rail is provided; and old mining districts in the mountain regions may spring into renewed life with the coming of the railroad and new deposits of precious metals may be discovered.

These new lines of railroad—and more—will be needed to handle the freight and passenger traffic which will originate in Montana when her resources shall have been developed.

From the Government Crop Reporter, July 1910.



GLACIER NATIONAL PARK.

The Glacier National Park was established by an act of Congress, May 11, 1910. The territory embraced contains about 14,000 square miles with approximately equal areas east and west of the continental divide in Teton and Flathead Counties. The principal entrance to the Park is by way of Belton on the Great Northern Railway, four miles south of Lake McDonald, but there are many other entrances giving the tourist access to different sections of the park.

From the Park the waters flow to the Hudson Bay, Gulf of Mexico and the Pacific Ocean. The mountain scenery is of unparalleled grandeur and beauty.

Prof. John H. Edwards gives the following description of Lake McDonald and vicinity:

In the heart of the Rockies, in the northern part of Montana, surrounded by mountain peaks in bewildering varieties of form, lies beautiful Lake McDonald. Not quite so large as Yellowstone Lake, it surpasses that loftiest of American mountain lakes of approximate size in grandeur of scenery. From this lake twelve miles of bridle path lead on to Avalanche Basin, a deep recess shut in between a horse-shoe sweep of granite cliffs that rise 2,500 feet above the turquoise lake in its center, while all around the mountains lift their heads to a height of two miles above sea level. These lakes and rivulets are all fed by the melting glacier above. This neighborhood furnishes the best opportunity to study living and dying glaciers to be found within our National boundaries, Alaska excepted.

John Muir, whose name is borne by the finest of Alaska's glaciers, has written in ardent appreciation of this region. Six thousand five hundred feet above sea level and seven miles from the head of Lake McDonald is the Glacier Camp, from which an hour's climb leads to Sperry's Glacier, named after the explorer and lecturer, Prof. L. B. Sperry, of Oberlin. The serrated edge of this interesting ice formation measures in width over two miles, and from its upper edge to the end of the longest finger is a stretch of five miles of blue ice. At one time this ice sheet extended a mile farther down and plunged over the abrupt precipice that walled the Avalanche Basin.

Its deserted track furnishes today an open page whereon the process of glacial erosion and deposit may be studied even more plainly and instructively than in the days of its greatest extent. Nearly every glacial phenomenon described in the books, it is said, may be found illustrated in this unique body of ice.

The following is a description in part given by Robert H. Chapman of the territory embraced in Glacier National Park:

The area of the Northern Rocky Mountains which lies to the north of the Great Northern Railway and to the south of the Canadian boundary is one of the most beautiful mountain regions in the world. To the east of the mountains the plains region, drained by the Missouri and

Looking S. E. from Triple Divide Mountain.

St. Mary's Lake.

Saskatchewan river systems, stretches mile upon mile of open grass land, practically treeless.

In sharp contrast to the plains rise the mountains, which, seen from the distance, present a rock wall of great steepness, extending apparently unbroken for miles. This, the eastern face of the range, is actually cut by long, deep U-shaped canyons, which have been largely formed by the great glaciers which once flowed from the mighty snow-covered peaks and ridges forming the divide between the waters of the Atlantic and Pacific oceans.

In the canyons are roaring streams, which head in the melting ice and snow, flow into placid lakes and eventually into the arroyos of the plains. Between the canyons the long, finger-like ridges rise to considerable heights, the timber-covered foot sloping steeply until a region of brush-covered broken rock is reached, which, in turn, leads to the base of precipitous cliffs.

In Glacier Park.

The canyons at the head usually terminate in great amphitheaters, rising cliff over cliff in a stairway of tremendous proportions, many steps of which retain an ice mass slowly flowing across it, each fed from a large ice field above, until a region of huge snow banks is reached. The main Rocky Mountain mass is actually made up of two principal ranges, generally parallel, with axis in a northwesterly and southwesterly direction, the easternmost of which is the Lewis range, which extends but a short distance across the Canadian boundary. The western, or Livingston, range, persists much farther northward. At a point about eleven miles south of Canada it becomes the watershed of the Continental Divide, which has previously followed the ridge of the Livingston range.

These ranges are the remnants of what was once a much wider plateau-like region of rock which has been carved and shattered by the forces of erosion, principally those of the glaciers. Upon this great mass are the higher peaks, huge pyramids and blocks, with cliffs and precipices hundreds and sometimes thousands of feet plunging away to the roaring streams of the valleys, or ending in the great crevasse at the head of some glacier.

To the westward the mountains break precipitously, and from the foot of the steep, long, timber-covered ridges reach out toward the valley of the Flathead river.

Between these ridges and extending up the canyons of the higher range are many miles of lakes, joined by rushing streams similar to those on the eastern side.

The whole region is inhabited by wild animals. The streams and lakes abound in fish of many varieties. In the higher barren rock areas the white goat is found in great numbers, while on the slightly lower ridges, where some protection is afforded by stunted timber growth, brush, and slide rock slopes, the bighorn Rocky Mountain sheep has his haunts. In the valleys and on the lower spurs are many deer and moose; in places a few elk are found, and over the whole area, from high glacier and snow fieldt o huckleberry bush of valley and flat, the grizzly roams.

All the game animals use the higher mountain districts for summer range only, as the area is too high and the snowfall too heavy to permit of winter use. * * *

There are numerous passes through the higher ranges. Across these the game trails lead from valley to valley; following the game came the Indians; the hunter and the trapper, looking for easy routes of travel, followed the Indians; then the government engineers exploring and mapping, and finally the hardier of the tourists and lovers of nature. Most of these passes are closed for many months of each year by snow; some of them are available only after the use of the ax to give footing on the hard ice of glaciers lying close to the divide, but one or two of them are of such a nature as to eventually accommodate wagon roads, by which persons unfitted for the strenuous efforts now required to reach the higher country may have opportunity to view it at close range. None of them that are south of the Canadian boundary will ever be used for a railway route. At some future day the locomotive may cross from Canada to the waters of the Flathead river and wend southward to the towns and farming valleys adjacent to Columbia Falls and Kalispell and form a link with the Great Northern Railway. A route on the west side of the Flathead river is very available for the location of a railroad track. In the valley of the Flathead river are several square miles of land which are admirable for grazing purposes, but over the greater part of the area the soil is so thin as to preclude its extensive use for farming.

Within these limits there are 250 lakes, ranging from ten miles to a few hundred feet in extent; there are more than sixty glaciers between five square miles and a few acres in area; there are animals, plants and rocks in number and quantity to satisfy the most ardent student, and views of great variety, beauty and grandeur to gratify the artist and lover of nature.

The following is a copy of the act of Congress which was approved May 11, 1910.

[PUBLIC—NO. 171.]

[S. 2777.]

An Act to establish "The Glacier National Park" in the Rocky Mountains south of the international boundary line, in the State of Montana, and for other purposes.

Be it Enacted by the Senate and House of Representatives of the United States in Congress Assembled:

Two Medicine Lake.

Sunset on Lake St. Mary's,
Near Line of G. N. Ry.

That the tract of land in the State of Montana particularly described by metes and bounds as follows, to-wit: Commencing at a point on the international boundary between the United States and the Dominion of Canada at the middle of the Flathead River; thence following southerly along and with the middle of the Flathead River to its confluence with the Middle Fork of the Flathead River; thence following the north bank of said Middle Fork of the Flathead River to where it is crossed by the north boundary of the right of way of the Great Northern Railroad; thence following the said right of way to where it intersects the west boundary of the Blackfeet Indian Reservation; thence northerly along said west boundary to its intersection with the international boundary; thence along said international boundary to the place of beginning, is hereby reserved and withdrawn from settlement, occupancy, or disposal under the laws of the United States, and dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States under the name of "The Glacier National Park;" and all persons who shall locate or settle upon or occupy the same, or any part thereof, except as hereinafter provided, shall be considered trespassers and removed therefrom: Provided, That nothing herein contained shall affect any valid existing claim, location, or entry under the land laws of the United States or the rights of any such claimant, locator, or entryman to the full use and enjoyment of his land: Provided further, That rights of way through the valleys of the North and Middle forks of the Flathead River for steam or electric railways may be acquired within said Glacier National Park under filings or proceedings heretofore or hereafter made or instituted under the laws applicable to the acquisition of such rights over or upon the unappropriated public domain of the United States, and that the United States Reclamation Service may enter upon and utilize for flowage or other purposes any area within said park which may be necessary for the development and maintenance of a government reclamation project: And provided further, That no lands within the limits of said park hereby created belonging to or claimed by any railroad or other corporation now having or claiming the right of indemnity selection by virtue of any law or contract whatsoever shall be used as a basis for indemnity selection in any State or Territory whatsoever for any loss sustained by reason of the creation of said park.

Grimmel Mountain, McDermott Lake.

Sec. 2. That said park shall be under the exclusive control of the Secretary of the Interior, whose duty it shall be, as soon as practicable,

to make and publish such rules and regulations not inconsistent with the laws of the United States as he may deem necessary or proper for the care, protection, management, and improvement of the same, which regulations shall provide for the preservation of the park in a state of nature so far as is consistent with the purposes of this Act, and for the care and protection of the fish and game within the boundaries thereof. Said Secretary may, in his discretion, execute leases to parcels of ground not exceeding ten acres in extent at any one place to any one person or company, for not to exceed twenty years, when such ground is necessary for the erection of buildings for the accommodation of visitors, and to parcels of ground not exceeding one acre in extent and for not to exceed twenty years to persons who have heretofore erected or whom he may hereafter authorize to erect summer homes or cottages; he may also sell and permit the removal of such matured, or dead or down timber as he may deem necessary or advisable for the protection or improvement of the park.

Approved, May 11, 1910.

Avalanche Basin.

MONTANA.

MONTANA lies between the 104th and 116 meridian of longitude west of Greenwich and between the 45th and 49th parallels of north latitude. The western boundary is irregular following a mountain range and in the southwest corner the boundary line is south of the parallel named.

Its average length from east to west is about 535 miles and its average width from north to south about 275 miles.

The area of Montana is 146,572 square miles which includes a water surface of 770 square miles.

Montana contains 93,806,080 acres of which 509,440 acres are water surface.

The land surface contains 93,296,640 acres.

The whole acreage belonged at one time to the United States Government, subject to whatever rights of occupancy the aboriginal Indians possessed. All titles trace back to a grant from the government which still owns all lands which have not been disposed of.

According to data furnished by the Commissioner of the General Land Office the status of lands embraced within the boundaries of the State of Montana was on July 1, 1910, as follows:

In reservations:		
Military reservations	231,307 acres	
National parks	1,100,177 "	
Indian reservations	5,558,464 "	
National forest reserves	19,474,696 "	
		26,364,644
Vacant public land		36,015,943
Withdrawn for reclamation projects		2,525,130
Carey Act projects:		
Applied for by State of Montana	524,440	
Segregated under Carey Act	172,249	
		696,689
Granted to State of Montana:		
Estimated School Grant	5,211,449	
Various educational and other grants	669,360	
		5,880,809
Grant to Northern Pacific Railroad		17,452,004
		88,935,219

Total acreage	93,806,080
Accounted for in table	88,935,219
Balance	4,870,681

The letter from which these figures were taken states that the acreage withdrawn for reclamation projects is given as of the date of September 5, 1910, that of the grant to the Northern Pacific Railway Company there had been certified 9,894,493 acres, that 543,797 acres had been certified to the State of Montana under the school grant and 661,948 acres under the educational and miscellaneous grants to the State.

The area of vacant mineral land, the Commissioner writes, has not been ascertained.

Trained observers well acquainted with the different sections but in possession of incomplete data have made estimates which divide the lands of Montana into three classes of about equal size, viz: Mountain lands, 30,000,000 acres; 2, Grazing lands, 30,000,000 acres; and 3, Arable lands 30,000,000 acres. The estimates will be modified as further knowledge is gained but will probably remain approximately correct. In places the character of the land is not distinctly marked, tracts of one or more of the classes lying close together and merging one with another.

The mountain area is not all mountainous land. It is intersected by numerous valleys, some of large extent, containing farms of the highest productiveness. Grass covered hills adjoin the valleys and are excellent pasture lands. Beautiful, grass covered parks are common throughout the mountains affording even at very high elevations the best of summer pasture. In the mountains also are to be found detached tracts suitable for farming or fruit growing.

In the valleys and basins of the mountainous part of Montana are millions of acres of farm lands. Those in the valleys are usually irrigated and yield most prolific crops of grains and grasses and fruits.

The mountains are covered with timber and lumbering is extensively carried on. Many acres of cut over lands will sooner or later be cleared and planted to crops or in fruit trees.

The mineral wealth of Montana is in the mountain area and mining is the chief industry of its inhabitants.

The rivers head in this region, have a rapid fall, carry large volumes of water and the amount of hydro-electric power they are capable of furnishing is so vast as to defy calculation. No part of Montana is too distant from a source of supply to be provided with electricity for purposes of light and power at low cost. The utilization of this great natural resource in lighting towns and cities and in furnishing power for mining operations, for manufacturing and for rural trolley lines has begun and will increase yearly; perhaps even the through trains of the trans-continental lines will sometime be hauled over the main divide of the Rocky Mountains by electric power obtained from convenient streams.

The national forest reserves are chiefly located in the mountainous regions where the streams head. On December 1, 1910 there were 20,389,696 acres of the soil of Montana reserved for national forests as follows by counties:

AREAS WITHIN NATIONAL FOREST RESERVES IN MONTANA.

County.	Acres.
Flathead	2,810,817
Missoula	1,792,362
Beaverhead	1,506,680
Ravalli	1,155,095
Madison	1,038,751
Sanders	1,033,094
Park	923,356
Lewis and Clark	862,167
Gallatin	815,019
Teton	794,958
Meagher	783,458
Granite	693,749
Custer	614,401
Powell	608,018
Jefferson	518,558
Cascade	436,867
Sweet Grass	442,524
Carbon	430,720
Deer Lodge	331,634
Fergus	235,901
Broadwater	226,478
Silver Bow	210,733
Lincoln	1,964,850
Rosebud	121,572
Chouteau	37,504
Total	20,389,6969

This table shows that more than one-fifth of the total area of the State of Montana is included within national forests. These have been laid out arbitrarily without consultation with the state authorities and with no regard to the wishes of residents of the communities nearest to them. The opinion prevails in Montana that the national forests as now constituted contain much land valuable for fruit growing and farming whose withdrawal from the public domain has blocked the development of localities. Here are two instances: Few counties in the United States have greater undeveloped natural resources than Flathead and Lincoln, of the total area of the former 68% is within forest reserves and of the latter 90%. All the forest reserves should be trimmed and all lands excluded that will be settled upon and cultivated. The development of the state should not be hampered by making it the field of experiment for the fanciful ideas of theorists who live in distant eastern cities, have no interest in promoting the welfare of Montana, and are ignorant of the needs of those who are performing the mighty task of subduing the wilderness and building homes, cities, and a great commonwealth in a region until recently uninhabited and into which they were invited by the liberal land policy of the United States Government—a policy which has led to the quick settlement and development of older Western States. That the management of the forest reserves should be closer to the people most interested in them and more appreciative of their needs and that the principle of conservation of natural

resources should not be confounded with a policy which erects barriers against progress is the judgment of many citizens of Montana. They are acquainted with the history of the settlement of the United States and remember that settlement and civilization have been advanced from one frontier to another by pioneers who overcame the most formidable natural obstacles and who received little help from the government. The founders and builders of the great states west of the Ohio River were not held back by bureaucratic control from Washington from exploring and settling upon any portion of the public domain to which the Indian title had been extinguished while Montana is confronted with the fact that more than one-fifth of its area is practically taken away from it. Not less than other citizens of the United States do the citizens of Montana realize the advantages that will result from a sane conservation of its natural resources but they insist that they are the best judges of its needs in this respect and of the means for accomplishing them. That government is best for the people which is nearest to the people.

Prospecting for minerals and entry of mineral claims are by law allowed to be made within forest reservations but are attended with discouraging restrictions. Firewood may be had by settlers on easy conditions; stumpage is sold for lumbering operations; and grazing permits, in limited numbers, are issued upon payment of the fees prescribed for the different kinds of live stock. There is a law which authorizes the making of homestead entries on certain classes of land within forest reserves; and a few applicants, having overcome the official prejudice of the forestry officials against everything that tends to a lessening of the area reserved and having rights too plain to be resisted, have secured the allowance of their claims. But neither the prospector nor the homeseeker is encouraged to explore the vast area locked up in forest reserves; on the contrary he is barely tolerated and is viewed with suspicion.

The great area in Montana which has been set aside for forest reserves is not wholly unproductive but it constitutes, nevertheless, an empire within an empire with all the disadvantages that attend such a condition. The time-honored idea that the Government of the United States held all lands for those who would come and make homes upon and develop them, that it was a temporary owner which desired that the public lands within the boundaries of every state should ultimately be owned by the state or by citizens of the state and become subject to state laws and state taxation has been discarded by zealous partisans of the new school of conservation. Some of these regard as a praiseworthy achievement the withdrawal from settlement and entry under the homestead and other public land laws of an area in Montana great enough to embrace several states. If there are any who have looked upon the policy which has governed the creation of forest reserves as one of prudent forethought for preserving breathing places for future generations let them compare the 843 acres comprised within Central Park, New York, with the 20,000,000 acres comprised within the forest reserves in Montana; or if a juster comparison be desired let them compare the 21,331,200 acres which constitutes the total acreage

included within the state of Massachusetts, Connecticut, New Jersey and Maryland with Montana's 20,839,696 acres in national forest reservations. The proportion of the receipts from forests which are paid to the State to be distributed to the counties is a small return for the withdrawal of this great area from the probability of becoming taxable property; and the policy of perpetual ownership of so large a part of Montana is not in harmony with the spirit of Western people or in accordance with the history of older public land states where the Government has disposed of its land and withdrawn as a land owner. Montana is not on a plane of equality with the other states of the Union if it has not as complete control of the land within its boundaries as they have of lands within their boundaries.

Upon the question of conservation of national resources and the relations of the states and the National Government in the matter of their control, Governor Edwin L. Norris of Montana, delivered the following address at the Irrigation Exposition at Chicago, November 28, 1910:

Speech of Governor Edwin L. Norris of Montana, Before the United States Land and Irrigation Congress, at Chicago, November 28, 1910.

CONSERVATION OF WESTERN RESOURCES.

It seems eminently fitting that a land and irrigation congress, organized for the purpose of exhibiting products of the soil, should be held in Chicago. This is the gateway between the populous centers of the East, wherein there is an overcrowded population striving for mere existence, and the great undeveloped West, where there are prosperous homes for millions of people. This is a truly cosmopolitan city where people are assembled from all points of the compass and are building the great American city.

Chicago in many ways has shown its interest in the west and that it fully realizes that much of its future growth depends upon Western development.

There is a satisfaction in having this opportunity of addressing a Chicago audience upon the subject of conservation of Western resources.

Several Western Governors journeyed to St. Paul in September last to take part in the deliberations of the National Conservation Congress, of which they were members. It was found on arrival there that delegates attending from the West, where almost all the unappropriated natural resources are to be found, were expected to sit at the feet of Eastern conservation sages and hear theories on conservation expounded. It is astonishing how wisely some men can talk on some subjects and how many high sounding theories may be advocated by them concerning something of which they have no practical knowledge. The Western delegates desired that some ideas be advanced which were adverse to the sentiments of the inner circle of men who controlled that Congress, but no opportunity was given for that purpose. Men from the mountains grow restless from inaction, and the western Governors returned home. Notwithstanding, their departure it was announced in the newspapers that the pugna-

cious Governor of Kansas would remain on guard to see "that the Western Governors did not start something." The Western Governors did not withdraw from the conference as was reported, but in fact many of them were named as vice-presidents of the Congress and will be on hand at the next meeting to give reasons for the faith that is in them, if opportunity is offered.

Let it here be said that Western men will not sit supinely by while this important problem is undergoing solution. We cannot admit that those who have proven themselves to be incapable of protecting their own are more competent that we are to formulate plans for the administration of resources that of right beling to us.

It is evident that extensive use and flagrant waste of resources have reached the danger point and that more careful consumption is advisable. An Omnipotent Creator has showered his gifts with lavish hand upon this nation and our people have used them with all the lavishness that characterizes the thoughtless. A prodigal son who has wasted his substance in riotous living may have the fatted calf served to him by an indulgent father, but a prodigal people who fritter away their resources will some day discover that Mother Nature has provided no inexhaustible storehouse for the wantonly wasteful.

It is fortunate indeed that the public conscience has been awakened and a sentiment favored to conservation has been created. All honor to those who caused that awakening and created that sentiment. The conservation of natural resources is a practical business problem. Sentiment serves as a spur to action but does not point the way. There is no subject which has produced so much talk and so little action. Many speak volubly about the necessity for conservation, but few advance practical ideas. Some 300,000,000 acres of the public domain, exclusive of that in Alaska, have been withdrawn from settlement, appropriation and use. These withdrawals include forest reserves, power sites, coal, gas and oil lands and phosphate beds. Large areas of agricultural and grazing lands are also included in the various withdrawals. The acreage withdrawn comprises an area equal in extent to one-half the territory east of the Mississippi River.

If today a large proportion of money were withdrawn from circulation, a financial paic of far-reaching effect and great severity would immediately ensue. These withdrawals have produced stagnation in development that is seriously felt in the West and indirectly affects industrial enterprises in Eastern commercial centers. When these resources will be opened to use and what harvest of evils may be reaped before development proceeds, no one can foresee.

In the State of Montana there are 93,000,000 acres of land and of that amount 42,000,000 acres have been withdrawn, and the end is not in sight. That commercial paralysis has not followed this condition is due to the development of resources, the title to which has heretofore passed from the government, and to the present activity in the improvement of agricultural lands. A people who can prosper under such conditions as

Montana people have deserved favorable consideration from their follow men everywhere.

The withdrawals of land were made for the purpose of preventing natural resources from passing into the ownership of special interests which would control prices of products and service. The objects sought to be attained were most praiseworthy and commendable. The first results are, however, far from satisfactory and prospects for future accomplishment are not reassuring. Objections to and defects in the proposed system of Federal conservation of resources can be best pointed out by a discussion of the different resources separately.

Forests.

The creation of reserves for the purpose of conserving the forests was wise and has proven most beneficial. Forests serve the double purpose of furnishing building material and protecting the watersheds. Building materials are necessary everywhere and especially in the growing and developing West. The wasteful and destructive methods of the past must cease and reforestation speedily engaged in or serious consequences will follow. The consensus of Western opinion is favorable to conservation of forests and, if need be, by the Government. There are very few who now oppose the policy of forest preservation and the opposition of those few will not prove of serious moment. There are many objections of merit to the methods employed in executing that system. The fact that protests are made to the manner in which certain details are carried out in forestry management should not be construed as opposition to the general policy of forest conservation. Captious fault finding serves no useful purpose, but meritorious criticism tends towards improvement.

The holding in reserves of lands that are more valuable for agricultural and grazing purposes than for the growing of trees is neither wise nor beneficial. Such a policy does not promote forest growth and limits agricultural production. The employment of land or any other resource in the capacity that will yield the larger returns is serving an economic function. The adoption of any other theory results in waste instead of conservation. Land is no longer so plentiful that soil suitable for growing foodstuffs should be used for growing trees. The timber should be sold and removed from the valleys and homebuilders given an opportunity to turn these fertile acres into cultivated fields.

There are uplands and hill and mountain sides sufficient in extent to grow all the forests necessary for supplying building material for future use. The time may come when all the farming lands will be required to supply food to a future population. The money received from the timber on the valleys referred to can be used to better advantage in purchasing unproductive lands in other sections that will be of more value for the growing of timber. Let all lands be used to serve the highest productive purpose and the greatest good to the greatest number will be accomplished.

Secretary Wilson is favorable to the elimination of agricultural lands from forest reserves and if permitted to continue his present policy will

open much land to entry that has heretofore been withdrawn. There are many enthusiastic forest conservationists who oppose this policy of segregating such lands and it is against the theory of these enthusiasts that this protest is made.

Cultivated fields serve as fire breaks and vantage points from which extinguishment of forest fires may be accomplished. The removal of dead and down timber eliminates fire traps and tends to lessen forest conflagrations. Extensive grazing of stock in reserves does not interfere with the growth of trees and close cropped vegetation does not spread fire. The ranges should be thoroughly grazed during the growing season so that dead grasses may not remain to communicate fire to the forests. Careless passers by, a neglected campfire, or a bolt of lightning ignites dry material and fire reaches the forests and wide destruction follows.

A wiser policy than that now obtaining would permit the entry and cultivation of all lands suitable for agricultural purposes in reserves and thereby increase production, make breaks in the long stretches of forests and place at vantage points men experienced and interested in the extinguishment of forest fires.

Water.

There are tracts of land situated along streams flowing over the public domain favorable located for use in the development of power. These power sites are the property of the Federal Government and have values which depend upon location and the right to the use of water flowing at that point. The States wherein sites are located have the authority to make all regulations for the disposition and use of water. This right of a State to the control of waters, except in navigable streams for navigation purposes, is clearly recognized by the Supreme Court of the United States in a long list of decisions from the case reported in 16 Peters to the Kansas-Colorado case reported in 206 U. S. The Supreme Court has also decided that the beds of streams belong to the State. The Government, therefore, owns the lands on public domain contiguous to the streams and the State possesses the beds and has the right to regulate the use of the waters of the streams. There seems to be but little basis for the assumption of the right by the Federal Government of authority to control water on the public domain for power development.

The Government can prevent construction of power plants on its lands by refusing the use of the necessary site adjacent to the streams, and the State can do the same by refusing to convey title to the bed of the stream whereon the dam must be constructed or by a denial of the right to appropriate waters. The right to use land, the beds of the streams and waters must unite in a common owner before development will be undertaken by investors. Even if the Government were lawfully seized of title to the beds of streams and the right to dispose of waters flowing over the public domain, it would not be the part of wisdom to exercise such rights.

The only benefits that others than residents of a given State can receive from such government ownership and control are those indirect

ones rising from revenues received and paid into the general fund of the treasury. After the payment of costs of supervision and control it is proposed to pay one-third of the amount received to the State and the other two-thirds to the Government so that the net amount received would be of small consequence. Upon the other hand the control and leasing of waters by the Government would produce conditions of serious moment in the States.

In the semi-arid West the most valuable function of water is the irrigation of lands. The introduction of Federal disposal of water rights for power purposes would most seriously interfere with and in many instances prevent the appropriation of water for irrigation purposes. This becomes patent when note is taken of the facts that the power appropriator would have the right to all of the flow of the stream at a given point and that diversions above for irrigation purposes decrease the flow at the power site. Hence the users for power purposes would strenuously object to diversions by later appropriators above for irrigation. There are now 1,500,000 acres under irrigation in Montana. Reclamation projects are in course of construction that will reclaim another million acres. There is an abundant supply of water, if its use for the purpose is not interfered with, to ultimately reclaim a total of 8,000,000 acres. The cultivation of this area will be of far greater value to the people of the Nation at large than would be the sums received from rental of waters for power purposes.

The growth and development of the West means prosperous homes for millions of people now striving for existence in populous centers. The irrigation and cultivation of the once designated great American desert means an ever increasing food supply and Western development means markets for Eastern manufactured products.

The National conservationists assume that the Government, having the right to control the navigable stream for navigation purposes, is also clothed with the right to control the headwaters of a stream for any purpose. This is erroneous for the reason that Government control is limited to the purposes of navigation and extends no further. The control by the State of the headwaters of the stream in no wise interferes with navigation. But let us take it for granted for the purposes of argument that in addition to the right to control navigable streams for navigation the Government also has the right to supervise the use of the headwaters of such streams for all purposes. That theory gives to the Government the same right of control over the Hudson River in New York or the Illinois River in Illinois as it gives over the waters of the Yellowstone River in Montana.

The fact that the Government does not own the land along the eastern as it does along the western streams is not material for the reason that the right of eminent domain can be exercised by the Government and power sites could be obtained on the payment of a just compensation to the owner. If it is a fact that the Government has the right to regulate the use of headwaters of navigable streams, then that right has not been lost by lapse of time or failure to exercise it. Hence this doctrine carried to its ulti-

mate conclusion might become the means of clouding the title to power-site heretofore constructed and in use wherever located.

I cannot conceive that the people of the eastern States are any less averse to surrendering the control of waters of streams for power purposes in their respective states than are the people of Montana to give up such privileges. It may be that the people of the East in looking for profits to be derived from western resources are assisting in creating conditions that will be more far-reaching than suspected, and that will touch more closely home than anticipated. This reference is pertinent in view of the fact that so far the conservation measures proposed relate only to resources in the public land States.

This fact produces a conviction that conservation of resources is not so much favored as a division is desired among the people of the Nation of proceeds from western resources that of right belong only to the people of the western states.

If the waters of western streams are to be leased for revenue purposes upon the theory that control for navigation purposes confers the right to regulate the headwaters of a stream, then let the same theory be adopted as to eastern streams and those waters leased for revenue purpoess by the Government for the benefit of all the people.

Minerals.

For the conservation of lands bearing oil, natural gas, coal and phosphate a leasing system is proposed. Lands valuable for metalliferous ores are not included. It is not possible in this address to treat all phases of conservation, and I shall, therefore, refer to mineral lands only in connection with general objections to the leasing system.

There are many objections to the present and proposed methods of the government in executing its policy of conservation.

The leasing of government resources places a burden upon consumers according to the amount of rental or royalty paid by the lessees to the Government. The lessees must add such sums as are paid to the Government by way of rental or royalty to the cost of production or service. Therefore the consumers and not the lessees contribute to the Government.

Electric power cannot be transmitted great distances at a profit on account of the loss in transmission, and coal cannot be transported indefinite distances on account of the excessive cost of transportation. Consumers in a given instance are those using power near the power plants and coal near the mines. These consumers must bear the burder for the benefit of those who share in the profit and not in the burdens. This is manifestly unjust. Wonderful stories are told of the fabulous values of resources and of the great profits that will result to all the people from their conservation. If any profits are received, it will be a small number of the same people who must pay them. The interests of the consumers are seldom considered but the producers have ever received the lion's share of attention. If I correctly interpret the verdict of the voters at the last election, the consumers have awakened to the fact that they have some rights and mean to have those rights respected.

There are rich and extensive resources as yet undeveloped but the costs of development and production have been overlooked in estimating returns and the net profits cannot be so great as anticipated. In no event will direct dividends be paid to the people of the Nation, but any revenues that are received by the Government will be covered into the general fund of the treasurer.

The adoption of the leasing idea will render necessary the employment of a costly system of administration that will further reduce the profits received. The distance of the seat of authority from the place of operation and the number of hands through which any government business must pass render government supervisian cumbersome and unsatisfactory and delays excessive. A government system of leasing resources is on a par with and would be attended by many of the evils and is as objectionable as government ownership and operation of railroads would be. If a policy of leasing resources is decided upon, then let the price that consumers must pay for products and service be the main idea in view rather than the amount of revenue that may be received. If it is finally decided that government supervision and leasing of resources shall be adopted and the suggestion just made not be accepted, then let the revenues received fror leases be paid to the State for the benefit of the people of the State wherein the resources are situate.

At least give the people of the respective States one of the advantages suggested. A leasing of resources by the Government and the taking of revenues derived therefrom very much resembles confiscation. This would indeed be a heavy burden for undeveloped States to bear.

The people of the Eastern States have had the benefits of their resources and we only ask the same privileges. We want those to come among us who will become permanent citizens and help us build up great and prosperous States.

The conditions under which Indian reservations have been opened to settlement have placed heavy burdens upon the Western States. The Indians once roamed at large, "monarchs of all they surveyed." They were driven back from time to time and finally located in Western reservations. Their lands were taken by the Government without compensation and largely given to homesteaders, and thus States were populated and developed. There are 12,000,000 acres in Indian reservations in Montana alone that have been or will be sold by the Government at an average of $4.00 per acre or for a total sum of $48,000,000.00. This money is used for the support of the Indians and is ample for the purpose. The settlers upon these lands are required to become residents of Montana and to pay this immense sum of money to the Government. The same conditions in varying degrees obtain in the other Western States. In other words, Western lands are made to support the Indians. Lands in the East and middle West are not so burdened. Such lands once belonged to the Indians and in fairness should bear proportionate burdens of their maintenance, as much so as the lands of the Indian reservations of the West.

This reference has not been made by way of complaint but rather to

show that the Western States are now carrying burdens that other States are not required to bear.

All difficulties could be avoided and a proper administration assured by a surrender to the respective States of government title to resources. This surrender should, however, be under such strict conditions and terms as would forever insure that the State would properly conserve, use and develop such resources for the benefit of the people of the respective States wherein situated. A further condition could be made that the grant should not be effective until the States enacted laws for the administration of such resources, satisfactory to the President and Congress. There is every element of safety and no element of danger in this course. The terms of the grant would become a covenant between the Nation and the respective states as binding as the obligation of the contract. By so doing a conservation and right use of resources would be assured. The claims of the State are based upon justice and efficiency of service would be best promoted by State ownership and control.

The people of a State are in closer touch and are more familiar with resources and conferring upon them direct responsibility and benefits would insure the best possible use. State officers are in closer contact with and are more directly responsible to the people whom they serve than are Federal officers. The nearer the governed are brought to the Government the greater is the assurance of good service. The actions of State officers are in full view of the people of the State, while the acts of Federal officers are not so closely observed. A mistake of the former causes general discussion, while an error of the latter produces no comment.

Those who favor national in preference to State conservation assign several reasons for their position. That the Government is stronger and therefore more effective than the States; that the States are not competent, and that the special interests could more easily influence a state legislation than they could influence Congress.

"The race is not always to the swift nor the battle to the strong," and the greater force is not always the most effective.

The administration of the public domain in the past by the Government did not reach the standard of efficiency that prevented the perpetration of many frauds. Contrast the administration of the public domain by the Government and the handling of granted lands by the States, and superiority is shown to be on the side of the States. It may be argued that the States have been limited by the conditions surrounding the granted lands and that such conditions have produced the superior administration. If such is a fact, then that is an argument in favor of conditional grants of resources to the States. If the States are so incompetent that trust cannot be reposed in them to properly administer resources under conditional grants, then from whence does the Federal Government obtain its superior wisdom and efficiency? The Nation is made up of the different States, and the whole can never be greater than the sum total of the parts. It must be admitted that too often the special interests influence the actions of Legislatures, but if a widespread conviction among the

people has any basis of fact, the special interests have been fully as successful in controlling the actions of Congress.

Several large power plants have been built or are in course of construction along the Missouri River in Montana and licenses to dam that stream were granted by Congress without conditions, compensation or limit of time. Early this year the State of Montana, acting through its Board of Prison Commissioners, requested permission to appropriate waters and build a ditch for conveying waters from a stream in a forest reserve to develop power to light and operate the State prison, conducted by the State. The permission was granted, but it was found later that a permit had been granted some months previous to private parties to build a ditch through this same forest reserve and to use the same water to develop power for general commercial use. Last spring an attempt was made by private parties to appropriate a power site and water right for power purposes on a section of the school lands in the State of Montana. The laws of the State provide that lands belonging to this grant can be disposed of only at public sale to the highest bidder and the appropriation being initiated in trespass could not become effective. Later an action was commenced against the State to obtain the water and site under the eminent domain law. While this action was being contested by the State Board of Land Commissioners, and near the closing days of Congress, a Congressman from Illinois introduced and succeeded in passing a bill granting to these parties an unconditional right to dam the Clark's Fork of the Columbia River at the point in question. Thus while the executive officers of the State were trying to save this property for the State a bill was passed in the lower House of Congress granting it away. Our senators were appealed to and the bill did not pass the Senate. Later the Supreme Court of Montana decided that school lands cannot be taken under the eminent domain statute. This demonstrates that Congress cannot always be relied upon, and that State officers may be more diligent than often given credit for.

What a State can do in conserving natural resources can best be illustrated by a statement of what Montana has done and proposes to accomplish in conserving resources that belong to the State. In February, 1908, or about nine months after the White House Conference, the Legislature of Montana passed a law providing that State agricultural lands should be sold only at public sale to cultivators, in limited acreage to each person; that title to coal lands should forever remain in the State and the right to mine for coal leased from time to time for periods not exceeding five years, for the highest royalty obtainable; that the title to all timber lands except such as are more valuable for agriculture than for reforestation purposes should forever remain in the State and the ripe timber should be cut from time to time all slashings burned and every precaution taken to encourage the growth of young timber, and that title to State lands bearing minerals other than coal may be acquired in a manner similar to the way provided in the Federal mineral land act.

The operation of these laws for nearly two years has demonstrated the wisdom of their enactment and proven their efficiency. These conserva-

tion measures were enacted in response to an overwhelming public sentiment in Montana favorable to conservation. Bills are now in course of preparation making adequate provision for the prevention and extinguishment of forest fires and for the regulation of appropriations of water for power purposes. Bear in mind that the Montana Legislature was in session only sixty days during the period since the White House Conference, and accomplished far more in conserving resources than Congress has accomplished in many months of sessions.

I know that the people of Montana are as competent,—yes, more competent—to administer the resources they now have or any others that may be entrusted to them and to protect themselves from the ravages of the special interests, however many or great, as are the people of other States or of all the States to do it for them.

A people who have accomplished so much and who propose to continue the good work deserve to be classed among those who favor conservation. Montana people have a way of doing things and not talking forever about it. They do it now. Pardon a personal reference. In some small way I have been concerned in the preparation, enactment and execution of laws conserving the resources of Montana and feel grateful for the opportunity here given of expressing the sentiments of the people whom I have the honor to represent.

Let there be no misunderstanding concerning our position on the conservation resources. We favor conservation and will approve of any plan best calculated to accomplish that end. We now believe that the States can best conserve resources under the safeguards heretofore referred to. If our proposed way is not the best way, then we will enthusiastically favor a better way.

We have a splendid State, rich in undeveloped resources, that offers unusual opportunities for the investor and the homebuilder. We have no place for the drones or incompetents. Energy and intelligence are the qualities that insure success in Montana.

The pioneers who crossed the plains, subdued the Indians and opened to commerce our rich resources have laid broad and deep the foundations of a splendid civilization, and upon that foundation we are now building the superstructure of a State that will be the pride of this and future generations.

NATIONAL FORESTS IN MONTANA.

Name.	Area.	Supervisor.	Address.
Absaroka	980,460	V. Clifford Lantry	Livingston.
Beartooth	685,293	Glen A. Smith	Billings.
Beaverhead	1,441,475	C. K. Wyman	Dillon.
Bitter Root	1,180,900	W. W. White	Missoula.
Blackfeet	1,041,340	J. F. Preston	Kalispell.
Cabinet	1,020,960	Ralph H. Bushnell	Thompson.
Custer	590,720	Elmer R. Brunke	Ashland.
Deer Lodge	1,030,850	D. T. Mason	Anaconda.
Flathead	2,092,785	Page S. Bunker	Kalispell.
Gallatin	907,160	D. T. Conkling	Bozeman.
Helena	930,180	J. B. Seely	Helena.
Jefferson	1,255,320	Wallace S. Perrine	Great Falls.
Kootenai	1,661,260	Dorr Skeels	Libby.
Lewis and Clark	844,136	Scott Leavitt	Choteau.
Lolo	1,211,680	Elers Koch	Missoula.
Madison	1,102,860	Clifton W. Hudson	Sheridan.
Missoula	1,237,509	D. G. Kinney	Missoula.
Sioux	145,253	C. A. Ballinger	Camp Crook, S. D.

Information about the method of procedure to secure a homestead within the limits of a national forest, application for permits to graze live stock or for cutting timber may be had on application to either of the supervisors named. W. B. Greeley, District Forester, Missoula, Montana is the chief officer of the forestry service in the State. The national forester is Henry S. Graves, Washington, D. C.

The grazing lands have been estimated at 30,000,000 acres and consist chiefly of foot hills and lands too rough for plowing. They include many parks within forests, foot-hills bordering valleys, bluff lands and bad lands; at places they merge into farm lands, at others into mountains or forests; their very extensive area may never be precisely defined but it seems certain that a very large proportion of the lands of Montana will always be chiefly valuable for grazing. The most nutritious grasses in the world cover the grazing lands and provide feed for countless heards of cattle and flocks of sheep. Live stock thrive on the native grasses, and Montana cattle and sheep bring the highest prices paid for range stock in the markets of Chicago. Although thousands of new farms have been fenced in the range country within the past two years the number of live stock has not decreased. The range is still vast in extent. As the new settlers get established they will combine stock-raising on a small scale with farming and the result will be that there will be more and better stock in Montana every succeeding year than there ever was—or could be—under range conditions.

The assessed valuation of live stock in Montana for the past four years was as follows:

1907	$32,531,152
1908	33,018,800
1909	36,864,680
1910	37,123,178

The lands which can be plowed, planted, cultivated and reaped with the usual implements and machines employed in farming operations in Montana are termed arable lands and are estimated at 30,000,000 acres. Less than two million acres are now in cultivation. The great bulk of of this unbroken farm lands is in the great plains region which extends from the Eastern boundary line to the foot-hills and outlying spurs of the Rocky Mountains. The land is usually level or gently rolling, covered with grass and free from rocks and bushes. Upon lands of this kind tens of thousands of homesteads have been filed in the past two years. At every land office in this region new claims are filed every day. Before many years elapse this great territory will be filled with settlers.

Arable lands include all farmling lands in private ownership, owned by the State of Montana, by the Northern Pacific Railway Company and within the area of unappropriated public lands of the United States; grazing lands are similarly owned.

The arable lands are either irrigated or non-irrigated. The area of irrigable land has been estimated at 8,000,000 acres. The acres at present under irrigation cannot be stated from any data now avail-

able. A report on the subject is expected to be made soon by the Census Bureau which has for months been collecting data respecting the irrigated lands of Montana. The forthcoming report will, no doubt, show a large increase in the number of acres under irrigation in 1910 over the number reported in 1900.

The report of the Twelfth Census (1900) shows that in 1899 there were 951,154 acres irrigated in Montana. Of 13,047 farms, excluding those in Indian reservations, 8,043 were irrigated and 5,004 unirrigated. Irrigation ditches were 2,902 in number, cost $4,683,073 and were 6,812 miles in length.

Farming began in valleys, near the mining camps where products were marketed, and where water for irrigation was easily obtained at a low cost. Water to irrigate small tracts was conducted from adjacent streams in ditches dug by individual farmers. Soon the advantages to follow co-operative efforts were realized and many ditches were dug by farmers whose lands were to be irrigated who united and formed an irrigation canal company. These companies were able to bring water from a greater distance than an individual of ordinary means. Capital was enlisted to some extent in the construction of ditches but did not go in on a large scale in early days. A few companies acquired large tracts of land conveyed water from a distant point and afterwards sold the land in small farms together with a permanent water right to settlers.

In 1894 the law known as the Carey Act was passed. Its passage was of much benefit to the development of the agricultural resources of the State. Some projects have been completed, adding largely to the irrigated acreage, others are in various stages of progress and there are still others where lands have been segregated but on which work has not been commenced. The purpose was to aid the public land states in the reclamation of desert lands therein and the settlement, cultivation and sale thereof in small tracts to actual settlers; and the Secretary of the Interior, with the approval of the President, was authorized to donate to the States named, Montana being one, upon proper appplication and after compliance with the terms of the act, not exceeding one million acres in each state as the state shall cause the same to be ririgated, reclaimed, occupied and not less than twenty acres of each one hundred and sixty acre tract cultivated by actual settlers.

The State of Montana is taking advantage of this act and has not itself directly engaged in the reclamation of lands but has caused the same to be reclaimed and settled upon by means of contracts entered into with individuals or companies. The State exercises the most vigorous supervision of the work of the contractors and no land is placed on sale until the State Carey Land Board is thoroughly satisfied that an ample and permanent supply of water has been provided.

The right to enter Carey Act lands being independent of the general land laws of the United States, no person will be disqualified from making entry because of any filings previously made under such general land laws.

Lands including perpetual water rights are sold on long time payments

on easy terms at prices ranging from $40 to $50 per acre. The completed projects have rapidly filled with settlers whose lands have enhanced in value since their purchase.

The following projects under the Carey Act have been completed in whole or in part and have lands for sale:

1. The Billings Land and Irrigation Company whose address is Billings, Montana. This was the first project to be completed. The lands segregated were 15,378.11 acres situated in Yellowstone County.

2. The Big Timber project of the Glass-Lindsay Land Company represented by Glass Bros., whose address is Big Timber or Helena, Montana. The lands are in Sweet Grass County and 32,647.83 acres were segregated some of which will be relinquished.

3. The Conrad Land and Water Company's project known as the Valier project, W. M. Wayman, Manager, Valier, Montana. The lands are in Teton County and 102.898.27 acres have been segregated.

4. The Dearborn project is an old one but has not been completed. The Ames Realty Company of St. Louis, undertook the project but did not carry out its contract. The Great Falls Land and Irrigation Company next undertook to reclaim these lands and it is hoped will successfully do so. The lands which have been segregated embrace 36,536.42 acres near Augusta in Lewis and lark County. Inquiries about this project should be addressed to the Carey Land Act Board, Helena, Montana, and to the Great Falls Land and Irrigation Company, suite 826, First National Bank Building, Chicago, Ill.

The projects named below are not sufficiently advanced to have land for sale.

5. For the Teton project, which is under contract with the Teton Co-operative Reservoir Company, the segregations asked for aggregate 134,987.42 acres. These lands are in Teton County near Bynum, and the representative of the project is T. A. Marlow, Helena, Montana.

6. For the Musselshell project situated near Martinsdale, Meagher County, the segregation of 20,308.87 acres have been asked for. For information concerning it application should be made to T. T. Black, Missoula, Montana.

7. For the Franklin project near Lavina the segregation of 22,285.96 acres in Fergus County have been asked for. Address the Frankling Irrigation Company, care John Edgerton, Helena, Montana, for information concerning it.

8. For the Flatwillow project, represented by Walter J. Winnett, Lewistown, Montana, the segregation of 84,447.98 acres in Fergus County, have been asked for.

9. The Red Rock Reservoir and Irrigation Company of Dillon, Montana, (represented by Newell C. Knight, 400 Royal Insurance Building, Chicago, Illinois), has built a costly dam to confine the water of the Red Rock River. For this project the segregation of 7,885.52 acres of land near Lima, Beaverhead County, has been asked for.

10. The Little Missouri Project is represented by Henry R. Albion,

Helena, Montana. The segregation of 19,644.97 acres of land near Erickson in Custer County has been asked for. It is proposed to utilize waters of the Little Missouri River.

11. For the Ruby River project the segregation of 22,285.96 acres of land near Sheridan, Madison County, has been asked for. The project is represented by R. A. Carnochan, Butte, Montana.

Excellent lands under the Carey Act projects have been sold by the three first named companies at a minimum price of $40 an acre. The completion of the other projects will be of enormous benefit to the State.

The next stage of development of the irrigable lands was their irrigation with water provided and sold by the United States Government.

The Government reclamation projects are undertaken under the act of June 17, 1902, known as the national irrigation law, which provides that money received from the sales of public lands in certain states and territories, of which Montana is one, shall be used as a reclamation fund for the construction of works necessary to irrigate arid lands. The fund is a revolving one. As soon as one project is completed and lands settled upon the replenishment of the fund begins from payments made by the entrymen. Payments are divided into ten annual installments without interest; and money so returned may be used over and over again for the construction of other works.

The Secretary of the Interior has withdrawn from the operation of the public land laws the tracts of lands that are to be reclaimed, and title to them can only be secured in accordance with rules made by him under authority of the Act. All settlers must make homestead entries and comply with the provisions of the law relative to settlement, cultivation and residence as in other cases, and must in addition pay the pro rata cost of water rights. The reclaimed areas have been divided into farm units ranging in size from 40 to 160 acres.

Soon after the passage of the Act the Secretary of the Interior caused numerous projects to be surveyed and approved a number of them for construction. Before any work was commenced about $20,000,000 had accumulated in the reclamation fund and at first the work of constructing the numerous approved projects proceeded with satisfactory speed; soon, however, the accumulation became exhausted and the department was unable to prosecute with vigor the work on all the projects that had been begun, the current receipts from the sale of public lands and repayment from water users not being sufficient. Many projects languished. To remedy this condition Congress passed at the last session an act providing for the issue and sale of certificates of indebtedness against the reclamation fund under which it is expected that much progress will be made in the completion of the reclamation projects already begun in Montana. The largest is the Milk River project concerning which it was necessary to enter into a treaty with Great Britain relative to the use of the water of Milk River, which, rising in Montana, flows north into Canada and returns to the state emptying into the Missouri river. Also arrangements have yet to be made with certain owners of land and water rights within the

project. The difficulties that have long delayed the completion, even in part, of this project which is so important to the development of northern Montana seem to have been, in large part, overcome.

Public announcement was made late in December that the President had approved the report of the engineers relative to the apportionment of the fund to be derived from the sales of certificates of indebtedness and that the allotment of $1,000,000 had been made for the Milk River project. Allotments from the general reclamation fund are made for continuation of work on the Huntley, Sun River and Lower Yellowstone projects. The allowance for the Sun River project is $3,278,000, and it is expected that the Milk River project will receive a total of $3,950,000, being 1,000,000 from the certificates of indebtedness fund and $2,950,000 from the general fund.

The allotments made to December 31, 1910, for Montana projects were as follows: Huntley, $955,000; Milk River, $593,000; St. Mary, $298,000; Sun River, $672,000 and Lower Yellowstone (in Montana and North Dakota) $2,910,000, according to the report submitted to the United States Senate by the Secretary of Interior. The expenditures to December 1, 1909, were for the whole, in round numbers, $3,950,000 so that relatively small sums have been available during 1910.

The Huntley project covers land in Yellowstone County near Billings extending in a compact body from Huntley to Bull Mountain on the south side of the Yellowstone River and is crossed by the Northern Pacific Railway and the Chicago, Burlington and Quincy Railroad.

This project was formally opened June 26, 1907, and up to July 1, 1910, 441 of the farms thrown open to entry had been filed upon, entries made and the lands placed in cultivation. There are still open to settlement about 140 farm units with a total area, including grazing lands, of 6,620 acres.

As to payments the Reclamation service furnishes the following information:

"The settlers on the Huntley project were and are required to make a first payment of $4.60 per acre. This is made up of a first payment against the cost of construction of $3.00 per acre based on an estimated cost of $30.00 per acre for the construction of the system, and a first payment of $1.00 per acre of the total $4.00 per acre due under the act of April 27, 1904, to the Crow Indians and 60 cents per acre, the estimated charge of maintenance for the first year the system is in operation. The settlers will have to pay the building charge of $3 per acre each year for ten years and 75 cents each year for four years, for the Indians, but the maintenance charge may be reduced if the costs warrant.

The total cost to the settler of the irrigated portion of these lands, including maintenance and operation for ten years, will probably be $40.00 per acre, the deferred payments without interest making the present worth cost only about $25.00 per acre. In regard to these payments it should also be noted that the land is exempt from taxes during the time of payments."

The land in the Huntley project yields good crops, is convenient to

the markets and has been settled upon by a thrifty class of citizens who are making improvements, as their means permit, and building comfortable homes. Schools and churches are numerous and prosperous towns have grown up. The region is destined to become thickly settled with prosperous farmers.

The Sun River project includes lands in Teton, Lewis and Clark and Cascade counties, near Great Falls. Sixteen thousand acres have been opened for entry in what was formerly the Fort Shaw Military Reservation. There are 206 farm units, the smallest being 40 acres and the largest 168 acres. The smallest area irrigable on any farm is 25 acres and the largest irrigable area is 115 acres. The average size of the farms is 88 acres, of which 61 acres is the average irrigable portion.

The terms of payment are that the construction cost repayable is $30.00 per irrigable acre which is divided into not less than five no more than ten annual payments, that $3.00 per acre of this sum be paid at the land office on making application for filing. The operation and maintenance cost was 50 cents per acre for the irrigable season of 1909, for which year the first building charge was applicable.

These lands are fertile, are near a large city, and will probably be traversed by one or more railway lines within a few years. Most of these lands have been sold.

The lands in the Montana portion of the Lower Yellowstone project border the Yellowstone River in Dawson County and about 65,000 acres in the project are suceptible of irrigation. The land is very fertile and few of the farms are unoccupied. At present there are about 20 farm units of public land now open to homestead entry and several thousand acres of land in private ownership which are held in areas in excess of the 160 acre maximum on which a single individual may perfect a water right under the Reclamation Act. These private lands are held for sale at prices from $15.00 to $30.00 per acre, subject to the terms of the Reclamation service notice of December 21, 1908, which provides for repayment of the building cost of the project at the rate of $42.50 per acre in ten annual installments, without interest. The operation and maintenance charge is fixed at $1.00 per acre per annum.

All the lands in the reclamation projects that have been opened for settlement are very productive and the homeseeker who has means enough to purchase a farm unit should make inquiry about them. For information about the Huntley project application should be made to the United States Land Office at Billings, about the Sun River project to the Land Office at Great Falls, about the Lower Yellowstone project, to the Land Office at Miles City; or concerning them or any other reclamation project in Montana to H. N. Savage, Chief Engineer, Reclamation Service, Helena, Montana.

In a letter of the Secretary of Interior to Senator Carter dated February 28, 1910, the irrigable area (main unit) of the Huntley project is given at 28,921 acres and the irrigable area opened; Public 25,729; private, 3,192 acres.

The irirgable area of the whole Sun River project is given as 276,000 acres; of the Fort Shaw Unit 16,000 acres. The irrigable area opened is Public, 12,433 acres; State, 377 acres; Private, 1,984 acres.

The irrigable area of the whole Milk River project in Chouteau and Valley counties as originally planned is 215,000 acres; of the Dodson South Unit, 10,000 acres. The ownership of irrigable lands (whole project) is: Public, 115,000 acres; States, 16,000; Private, 84,000 acres.

The Dodson unit will probably be the first to be completed. The whole area is near the main line of the Great Northern Railroad, the land is fertile and all staple crops yield large returns on irrigated lands. It is the expectation that the cultivation of sugar beets will be a main industry in the lands within the Dodson Unit and that a beet sugar factory will be erected at some convenient point.

The Lower Yellowstone project is in Dawson County, Montana, and McKenzie County, North Dakota. The irrigable area of the whole project is 64,222 acres. The ownership of irrigable lands (whole project) is: Public, 17,794 acres; State, 2,150 acres; Railroad, 5,584 acres; Private, 39,094 acres. The irrigable area opened: Public, 7,964 acres; State, railroad and private, 35,748 acres.

The St. Mary project is located in Teton County and is considered a feature of the main Milk River project.

The Blackfeet Indian Reservation project is at present confined to the Two Medicine irrigation system which will irrigate about 45,000 acres. These lands are in Teton County near the town of Cut Bank and lands under the main canal are crossed by the Great Northern Railroad. They may be opened for settlement in 1911.

The Flathead project contemplates the reclamation of 150,000 acres of land in Flathead, Sanders and Missoula counties in the old Flathead Indian Reservation.

Water will be taken from the Jocko river and several creeks rising in the Mission range. Storage reservoirs will be formed of lakes St. Mary and McDonald and other natural basins, and it is proposed also to pump water from Flathead Lake. Work on some of the units is in progress and canal systems covering 12,000 acres were completed in 1910.

With funds provided by the Indian Bureau, the Reclamation service is working on project within the Fort Peck Indian Reservation where it is believed it is possible to reclaim 144,000 acres. The reservation may be opened to settlement before long, in which event these reclaimed lands, if placed on sale, will, no doubt, be in great demand.

The progress of these works has been disappointedly slow; but since the passage by Congress of the law for the issue and sale of reclamation certificates and the application of the funds derived from their sale to the completion of projects already begun it is hoped that their construction will be prosecuted with energy. Montana will benefit by the completion of these projects but the withdrawal of large tracts for reclamation purposes and the failure to reclaim them within a reasonable time has checked efforts on a smaller scale that might be made by private capital to irrigate

a part of the lands withdrawn under the reclamation or Carey acts and has prevented settlement upon large areas by dry land farmers. Public policy demands a vigorous effort to complete these projects or the restoration to the public domain of the withdrawn lands.

The completion of the projects already begun under the national irrigation and Carey acts will far from exhaust the area of land to which water may be brought profitably for purposes of irrigation. There remain opportunities for projects under the Carey act which should attract capital. Large tracts in Madison and Ravalli counties will obtain water from reservoirs now building or recently completed. The numerous small irrigating canals which were built in early days to supply water to small tracts were built in early days to supply water to small tracts were constructed when labor was difficult to secure, when present day ditch-digging machinery had not been invented, when land was cheap and not in demand, when the services of an irrigation engineer were not available, and when farming was usually an incident to stock raising and there was no inducement to make the ditch carry more water than was needed at that time for the limited farming operations that were carried on. Water was brought on lands with less of effort and at a lower cost than in any other state. Conditions have changed; irrigated lands are in demand at a high acreage valuation—though low compared with irrigated lands in other states; and the possibilities of increasing the area that may be irrigated from the sources of water supply for the ditches constructed in early years by building reservoirs to store water which now runs to waste, by improving existing ditches, changing their course and building new ones when necessary, and by putting a stop to the very large percentage of loss of water by seepage in poorly constructed canals should receive earnest consideration. As a first step towards advancement in this respect it is essential that all water rights should be adjudicated. When this shall have been done and water is distributed at the right time to those having the right to it, conditions in the irrigated districts will be improved and those who find their water supply short will seek a means of obtaining an additional quantity.

By far the greater part of the arable lands are those which are not—and can not—be irrigated. They are usually called dry farm lands and are to be found in every county.

The western part of the state is traversed by many mountain ranges between which are large and fertile valleys. Copious streams flow from the mountains and water the lowlands. The forested area comes close to the valleys but there are tracts from which the forest growth has been removed and foothill lands sufficiently level for plowing which are now farmed without irrigation.

The rainfall is greater in western than in eastern Montana and the climate milder. Farming without irrigation has been long pursued in this section, the natural rainfall being usually sufficient. The farm lands are limited by the mountains and forests but are being constantly extended. Upon the recently opened Flathead reservation hundreds of homes have already been established.

This section of Montana is famous for the excellence of the apples, cherries and other fruits which grow there in perfection. Fruit growing is the main agricultural industry, the older orchards being on irrigated lands.

Farmers and fruit growers whose lands are not irrigated will find that the approved methods of dry farming bring best results even in this section of comparatively ample rainfall.

Eastern Montana is a part of the great plains region of the United States the average elevation being from 2,000 to 3,000 feet. Outlying ranges are found east of the main range of the Rocky Mountains and mountain masses rise abruptly in the central part of the plains. This great region is drained by the Missouri, Yellowstone, Milk, Musselshell, Marias, Judith, Big Horn and Powder rivers and their numerous tributaries. The valleys are narrow; there are many coulees and gulches; there are streams that go dry in summer and others which flow the year around. Back from the valleys are the bench lands which are rarely visible from passenger trains. These are the dry farm lands. Often as far as the eye can see is a beautiful expanse of rolling land free from rock and bush, abundantly covered with grass, unoccupied and unused save as a pasture for sheep and cattle, now ready for the plow and destined in a few years to be transformed into a region of productive farms.

This is the kind of land on which thousands of new settlers who have come to Montana in the past two years have made their homes and started dry farms.

Farming without irrigation—dry farming—in Montana is no longer an experiment—it is a demonstrated success, not for one experiment farm only but in every part of the state.

The year 1910 was one of unusual drouth throughout the United States, yet on July 1st, 1910, the condition of spring and winter wheat in Montana was only six below normal, and at the dry farm experiment station near Great Falls there were yields of 37 bushels of oats, 30 of rye, 27 of wheat and 11 of flax.

The reason why farming without irrigation is successful in Montana is because the rainfall is sufficient when properly conserved. It is properly conserved when the instructions of the Montana Agricultural Experiment Station are followed.

On properly cultivated dry farms in Montana the percentage of crop failures should be as low as in humid states.

The average precipitation in Montana for the ten year period preceding 1907 was 15.57 as shown by reports from all the weather stations and the average for the next decade is not likely to be materially different. Local conditions cause the precipitation to be much greater at one place than another so that the significant fact is the record of the minimum rainfall, which is found to be above that at which crops have been successfully raised in other states where the soil conditions were favorable and the cultivation was properly done.

The small map on this page shows the average annual precipitation within the areas indicated by lines.

The Department of Agriculture has recently issued a most interesting and valuable bulletin entitled "Dry Farming in Relation to Rainfall and Evaporation." (U. S. Department of Agriculture, Bureau of Plant Industry, Bulletin No. 288), which contains a discussion of dry farming in relation to the amount and character of the rainfall and evaporation in the western United States. "Usually" it says, "in discussing dry-farming conditions the annual precipitation is the only feature of the rainfall that receives attention. But there are other factors in connection with

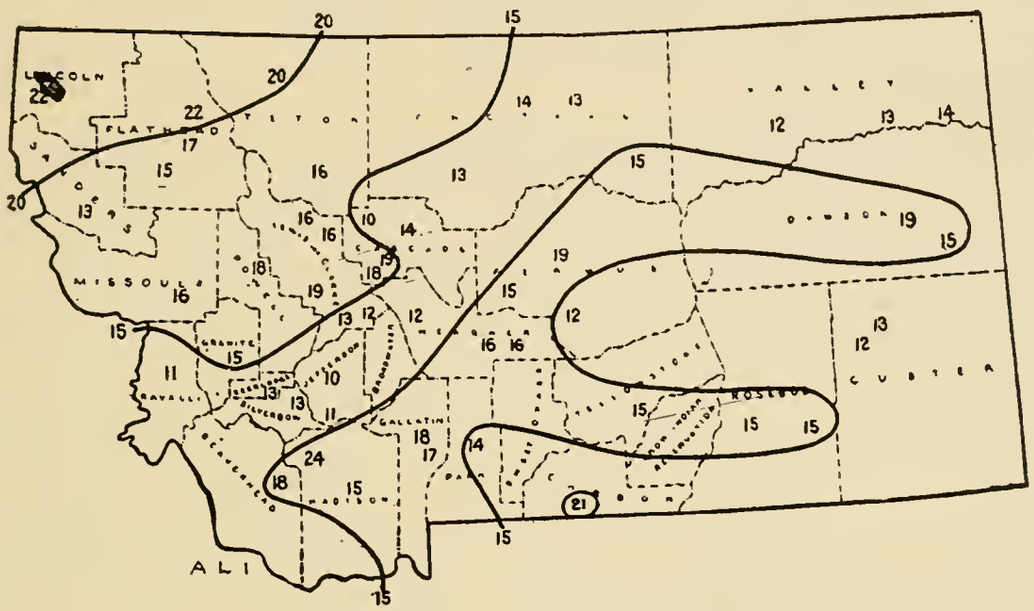


FIG. 11.—Rainfall map of Montana. The figures show the average annual rainfall in inches From Bulletin No. 188, Bureau of Plant Industry, U. S. Dept. of Agriculture.

the rainfall that have much to do with the successful production of crops. The seasonal distribution of the rain, the rate at which the rain falls, and the amount of rain that is lost through run-off from the surface all have an important part in determining the percentage of the total rainfall that is really available for the use of crops. Finally, the amount of evaporation which takes place during the growing season determines to some extent the amount of rain that is needed to produce a crop, and this varies greatly in different localities. Prospective settlers in these regions are apt to give very little attention to climatic features other than the total rainfall. They often do not even assure themselves that the figures given for a region represent the normal rainfall and not simply the rainfall for a single year. They ignore almost completely the seasonal distribution of the rain, the frequency of torential rains, the loss of water through surface run-off, the occurrence of hail, and the amount of evaporation."

Why the dry farm lands of Montana are more productive than other lands within the dry farming belt of other states where the precipitation is similar is explained in the bulletin as follows:

"Dr. H. L. Shantz, of the Bureau of Plant Industry, finds that the distribution of a native grass is a good index of the rainfall required in

different sections of the Great Plains. Short grass, which consists chiefly of buffalo grass and grama grass, is well suited for this purpose, since it occurs from Montana to Texas. In each section the grass grows as far west as the opposing influences of rainfall and evaporation will permit. Its growth to the east is checked by competition with the prairie grasses. Thus we have a strip of short grass extending from Montana to Texas, limited on the west side by drought and on the east by competition with other grasses. Therefore the increase in the annual rainfall as we go from north to south in the short grass region represents the additional amount of rain needed to offset the increased evaporation. In Montana, short grass unmixed with other grasses occurs in districts having an annual rainfall of approximately 14 inches; in Colorado, in regions having a rainfall of 17 inches; and in the Panhandle of Texas, in regions having an annual rainfall of 21 inches.

The same type of native grass requires in Texas 7 inches more of rain a year than in Montana. This gives us at once a measure of the additional amount of rain required for a grain crop in Texas as compared with Montana. Furthermore, the evaporation in Texas during the six summer months exceeds that in Montana by about 20 inches. Therefore, if the summer evaporation at one place in the Great Plains exceeds that at another by 3 inches a corresponding increase in the summer rainfall of approximately 1 inch at the first place is needed to offset the increased evaporation. A rainfall of 21 inches in the Panhandle of Texas is really therefore no better for growing crops than 15 inches in Montana or Dakota, owing to the greatly increased evaporation on the Texas plains."

Dry farming in Montana means tillage with from ten to eighteen inches of annual rainfall. Director Linfield of the Montana Agricultural Experiment Station calls attention to the fact that "the season of maximum rainfall is at the season of the year when it is of the greatest value for the growth of crops, viz: April, May, June and July." "During these months," he says, "we get nearly as much rainfall as in the humid districts of the East."

Havre, Chouteau County, is a town in the great plains region of Northern Montana where a station of the United States weather bureau has been maintained for many years. Accurate observations have been made and recorded of the yearly and monthly precipitation. For the ten years last past the annual precipitation in inches has been as follows: 1900, 11.43; 1901, 15.03; 1902, 12.94; 1903, 16.03; 1904, 8.61; 1905, 6.76; 1906, 14.13; 1907, 13.28; 1908, 11.92; 1909, 16.60. The precipitation for the same period during the growing months was as follows:

Year.	April	May	June	July	Total
1900	1.38	0.88	0.62	1.37	4.25
1901	1.66	3.50	2.75	1.74	9.96
1902	0.15	4.77	3.80	0.79	9.51
1903	0.95	3.47	1.51	5.23	11.16
1904	0.34	2.24	2.29	0.43	5.30
1905	0.70	0.83	1.72	0.86	4.11
1906	0.09	3.32	4.37	0.17	7.95
1907	0.89	1.87	3.85	1.46	8.07
1908	0.28	1.87	3.25	0.39	5.79
1909	0.92	2.98	3.91	3.88	11.69

Havre is a station where the rainfall is hardly up to the average of Montana yet the figures confirm Director Linfield's statement in a striking manner.

The State of Montana and the United States Government in cooperation, aided by railroad companies and public spirited citizens in certain cases, have established a number of experiment farms to test the capability of the soil to raise crops without irrigation and to determine the best methods of cultivation and the best crops to grow. These tests have been made on lands representative of large areas of uncultivated lands in the various counties, have been carried on over a number of years, and the results carefully recorded.

At the Agricultural Experiment Station at Bozeman results of the experiments that have been made at all the sub-stations are now being collected and will soon be published in a bulletin that will be sent to those who ask for it.

The Department of Agriculture has recently issued a valuable bulletin upon cultivation methods and rotation of crops in the dry farming section. There are reports from stations in North Dakota, South Dakota, Nebraska, Colorado, Kansas, Texas and Montana.

The different methods of cultivation and different systems of crop rotations cause variations in the yield, but the striking fact in all of the tables is the superior productiveness of the Montana farm.

Of wheat the Dickinson, North Dakota, station yield in 1909 in bushels 24.3, 17.7 and 35.7; the Bellefourche, South Dakota station 23.8, 23.3 and 32.2; the North Platte, Nebraska station, 24.5, 26.0 and 31.8; the Akron 32.2; the North Platte, Nebraska, station, 24.5, 26.0 and 31.8; the Akron, Conorado, station 14.3, 10.3 and 18.5; the Garden City, Kansas, station, 2.1, at the Judith Basin, Montana, station was 33.0, 33.4 and 34.0.

Of oats yields of 75.3, 66.2 and 78.7 bushels are reported from the Montana station against a maximum of 66.6 from all other stations, the average being 30.16, 30.5 and 44.11.

Of barley the average of all stations was 21.11, 22.88 and 30.74. At the Judith Basin station, Montana, it was 45.2, 43.3 and 49.4.

The Montana Experiment farm known as the Judith Basin station is located in Fergus County on land typical of millions of acres in the Judith Basin. In no section of Montana has so much land been broken and planted to crops in the last few years and the yields have been uniformly remarkable. The rainfall at the Judith Basin station for the growing months of the year 1909 was as follows, in inches: April 0.61, May 7.31, June 2.45, July 0.20; total 10.57.

The increase in the agricultural production of Montana which has been so marked in recent years has been chiefly on farms cultivated without irrigation, dry farms; and the fact that there are perhaps 20,000,000 acres of untilled lands which when cultivated by the same methods will produce crops equal to those produced at the experiment farms will cause Montana to become one of the first of the states in the annual value of crops raised.

Montana has the land and it needs farmers to till it; it wants men of energy and intelligence with capital sufficient to equip a farm and maintain it until the first harvest; and it offers them the opportunity to acquire a tract of fertile farm land free or at low cost, an independence, perhaps fortune, such as they may seek for in vain elsewhere.

The proper methods to be followed in dry farming should be learned by all new comers if they wish to avoid failures. They are set out in a pamphlet of the Montana Agricultural Experiment Station entitled "Dry Farming Practice in Montana," a copy of which will be sent to any address by this bureau, on request.

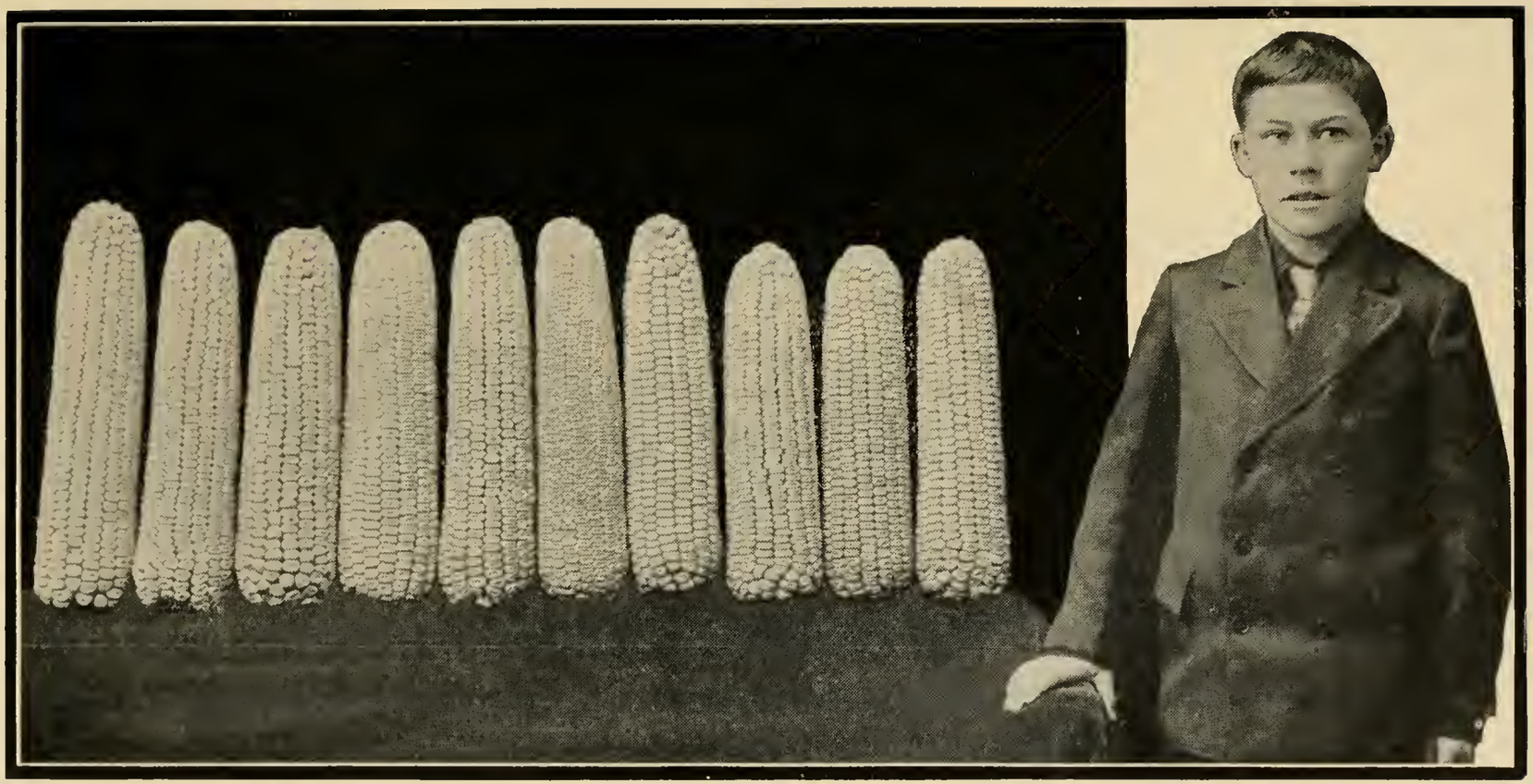
Below will be found tables of statistics of the chief crops for the years 1899 to 1910:

Wheat.

Year.	Acres.	Bushels.	Value.
1899	69,764	1,792,630	$1,093,690
1900	72,555	1,929,963	1,177,277
1901	88,807	2,353,386	1,576,769
1902	90,583	2,355,158	1,460,198
1903	98,735	2,784,327	1,837,656
1904	108,608	2,596,731	2,311,091
1905	119,469	2,843,326	2,018,787
1906	137,389	3,297,336	2,110,295
1907	139,000	4,003,000	3,243,000
1908	153,000	3,703,000	3,185,000
1909	350,000	10,764,000	9,364,000
1910	480,000	10,560,000	9,081,000

Oats.

Year.	Acres.	Bushels.	Value.
1899	60,986	2,317,468	$ 903,813
1900	65,865	2,568,735	1,078,869
1901	147,365	6,189,330	2,228,159
1902	159,154	6,668,553	2,400,679
1903	162,337	7,532,437	2,636,353
1904	167,207	6,303,704	2,899,704
1905	178,911	7,389,024	3,177,280
1906	196,802	8,501,846	3,740,812
1907	240,000	11,760,000	5,410,000
1908	254,000	10,566,000	5,177,000
1909	300,000	15,390,000	6,464,000
1910	350,000	13,000,000	6,118,000



IGNATIUS O'DONNELL OF BILLINGS, AND HIS CORN.
This youth won first prize in the James J. Hill Corn Growing Contest for Montana boys.

Barley.

Year.	Acres.	Bushels.	Value.
1899	6,183	216,405	$110,367
1900	5,194	201,527	96,733
1901	16,398	639,522	364,528
1902	17,874	661,338	337,282
1903	18,231	732,886	425,074
1904	17,502	523,310	324,452
1905	15,227	502,491	281,395
1906	14,313	472,329	264,504
1907	17,000	646,000	400,000
1908	25,000	875,000	534,000
1909	50,000	1,900,000	1,197,000
1910	52,000	1,456,000	903,000

Rye.

Year.	Acreage.	Bushels.	Value.
1899	....	.....	$.....
1900	....	.....	.....
1901	1,834	48,968	29,381
1902	1,871	46,775	29,936
1903	1,890	46,494	29,291
1904	1,871	37,233	28,669
1905	1,871	37,420	24,323
1906	2,021	41,430	27,344
1907	2,100	47,000	32,000
1908	2,000	40,000	27,000
1909	2,000	58,000	44,000
1910	4,000	80,000	54,000

Potatoes.

Year.	Acreage.	Bushels.	Value.
1899	4,597	648,177	$ 343,534
1900	4,781	640,654	339,547
1901	....	.....	.....
1902	11,521	1,762,713	881,365
1903	12,904	2,271,104	999,286
1904	13,162	1,882,166	1,148,121
1905	13,688	1,642,500	969,110
1906	14,099	2,143,048	1,307,459
1907	18,000	2,700,000	1,350,000
1908	20,000	2,760,000	1,932,000
1909	25,000	4,500,000	2,295,000
1910	25,000	3,000,000	2,555,000

Corn.

Year.	Acreage.	Bushels.	Value.
1901	3,095	77,375	$ 69,638
1902	3,714	81,708	58,830
1903	3,788	91,291	56,600
1904	3,902	86,624	58,904
1905	3,941	76,451	51,989
1906	3,980	93,132	60,536
1907	4,000	90,000	61,000
1908	4,000	94,000	85,000
1909	5,000	175,000	150,000
1910	8,000	184,000	175,000

Flaxseed.

Year.	Acreage.	Bushels.	Value.
1908	9,000	104,000	$ 104,000
1909	10,000	120,000	192,000
1910	60,000	420,000	1,008,000

Hay.

Year.	Acreage.	Tons.	Value.
1899	361,923	513,931	$3,957,269
1900	369,161	590,658	5,138,725
1901	....	.....	.....
1902	313,606	526,858	3,972,509
1903	335,558	697,961	6,149,036
1904	348,980	670,042	5,829,365
1905	362,939	580,702	4,471,405
1906	373,827	691,580	6,155,062
1907	500,000	850,000	8,075,000
1908	525,000	1,050,000	8,768,000
1909	556,000	995,000	9,950,000
1910	600,000	840,000	10,500,000

From the statistics for 1909, published in the Government Crop Reporter, the following tables have been compiled. They show how the Montana farmer fared in 1909 as compared with farmers in other states:

Comparative yields for 1909, compiled from the Government Crop Reporter, published by the Secretary of Agriculture, December, 1909:

State.	Bushels per Acre Wheat.	Bushels per Acre Oats.	Bushels per Acre Barley.	Bushels per Acre Rye.	Bushels per Acre Flax.	Tons per Acre Hay.	Bushels per Acre Potatoes.
Montana	30.6	51.3	38.0	29.0	12.0	1.79	180
Illinois	17.4	36.6	28.0	17.8	....	1.45	91
Iowa	18.1	27.0	22.0	17.8	9.8	1.64	89
Missouri	14.7	27.0	25.0	15.0	8.1	1.35	85
Kansas	13.0	28.2	18.0	14.2	7.0	1.45	79
Nebraska	16.7	25.0	22.0	16.5	8.5	1.50	78
Minnesota	16.8	33.0	23.6	19.0	10.0	1.75	115
Wisconsin	19.7	35.0	28.0	16.3	14.5	1.53	102
Michigan	18.8	30.5	24.7	15.5	....	1.30	105
Indiana	15.3	30.5	23.5	16.5	....	1.40	95
Ohio	15.9	32.5	25.9	17.2	....	1.43	93
North Dakota	13.7	32.0	21.0	18.3	9.3	1.37	110
South Dakota	14.1	30.0	19.5	17.5	9.4	1.50	80
United States	15.8	30.3	24.3	16.1	9.4	1.42	106

Farm value per acre of leading crops, December 1, 1909:

Crop.	Minnesota.	North Dakota.	South Dakota.	United States.	Montana.
Wheat	$16.12	$13.70	$14.10	$15.87	$26.62
Oats	11.55	10.56	10.20	12.27	21.54
Barley	11.09	9.03	8.77	13.41	23.94
Flax Seed	15.00	14.60	14.19	14.34	19.20
Potatoes	40.25	49.50	50.40	58.19	91.80

Farm value of 160 acres of crops in the states named for the year 1909:

State.	Wheat.	Oats.	Barley.	Flax Seed.	Potatoes.
Minnesota	$2,579.20	$1,848.00	$1,774.40	$2,400.00	$6,440.00
North Dakota	2,192.00	1,689.60	1,444.80	2,336.00	7,920.00
South Dakota	2,256.00	1,632.00	1,403.20	2,270.40	8,064.00
United States	2,539.20	1,963.20	2,145.60	2,294.40	9,310.40
Montana	4,259.20	3,446.40	3,830.40	3,072.00	14,688.00

The Department of Agriculture publishes statistics showing the average yield per acre and the average farm value per acre of the principal crops for ten year periods.

For the periods 1876-1885, 1886-1895 and 1896-1905 the average yield of wheat in bushels per acre was in Montana 17.7; 19.8 and 26.9 respectively against 12.3, 12.7 and 13.5 for the whole United States.

The average farm value per acre of wheat for the same periods was in Montana $18.67, $14.37 and $15.58; and for the United States $11.39, $8.67 and $9.37.

For the periods 1876-1885, 1886-1895, and 1896-1905 the average yield in bushels per acre was in Montana 35.9; 32.7 and 41.0 respectively against 2.76, 25.6 and 29.6 for the United States.

The average farm value per acre of oats for those periods was in Montana $18.67, $14.45 and $15.58 and for the United States $15.42, $11.95 and $14.15.

For the periods 1876-1885, 1889-1895 and 1896-1905 the average yield of barley in bushels per acre was in Montana 29.9, 27.3 and 35.02 respecively against 21.4, 22.1 and 24.8 for the United States.

The average farm value per acre of barley for those periods was in Montana $23.32, $15.83 and $19.01 and for the Unietd States, $13.84, $11.03 and $10.34.

More recent statistics from the Year Book of the Department of Agriculture for 1909 are grouped in the following table:

Average yield per acre and average farm value per acre of wheat in states named and in the United States.

	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
North Dakota.	4.9 $2.84	13.1 $7.07	15.9 $9.22	12.7 $8.00	11.8 $ 9.56	14.0 $9.66	13.0 $8.19	10.0 $8.70	11.6 $10.67	13.7 $12.60
Minnesota	10.5 $6.62	12.9 $7.74	13.9 $8.48	13.1 $9.04	12.8 $11.14	13,.3 $9.44	10.9 $7.08	13.0 $11,.96	12.8 $12.03	16.8 $16.13
Iowa	15.6 $9.20	16.2 $9.75	12.7 $6.96	12,.4 $7.69	11.6 $10.48	14.2 $10.08	15.7 $10.07	13.4 $11.03	17.2 $15.70	17.0 $15.77
Missouri	12.5 $7.88	15.9 $10.97	19.9 $11.54	8.7 $6.18	17.7 $11.23	12.4 $9.80	14.8 $9.92	13.2 $11.00	10.0 $9.30	14.7 $15.43
United States.	12,.3 $7.61	15.0 $9.37	14.5 $9.14	12.9 $8.90	12.5 $11.58	14.5 $10.83	15.5 $10.37	14.0 $12,.26	14.0 $12.97	15.8 $15.02
Montana	26.6 $16.23	26.5 $17.76	26.0 $16.12	28.2 $18.61	23,.9 $21.28	23.8 $16.90	24.0 $15..30	28.8 $23.33	24.2 $20.82	30.8 $26.75

Kansas which ranks next to North Dakota as the leading wheat producing state was far below Montana in 1909 in the average yield and farm value per acre. The average yield of wheat and the average farm value per acre in Kansas for the past ten years were as follows:

Year.	Bushels.	Farm Value.	Year.	Bushels.	Farm Value.
1900	17.7	$ 9,.73	1905	13.9	$ 9.88
1901	18.5	10.92	1906	15.1	8 75
1902	10.4	5.73	1907	11.0	9.13
1903	14.1	8.33	1908	12.6	11.06
1904	12.4	11.06	1909	14,.4	13.85

The chances of a crop failure or a shortage of yield are less in Montana than in other states as the variations in the average yields during the years 1900-1909 show.

The high and low average yield of wheat in bushels per acre for all the years in that period was as follows:

State.	High.	Low.
North Dakota	15.9	4.9
Minnesota	16.8	10.5
Kansas	18.5	10.4
United States	15.8	12.3
Montana	30.8	23.8

For the period 1900-1909 the following comparisons may be drawn from the government crop statistics:

The lowest yield of Montana was greater than the highest yield of North Dakota, Minnesota or Kansas by 28%.

The lowest yield of Montana was greater than the highest yield for the United States by 50%.

The lowest yield of Montana was greater than the lowest yield for the United States by 93%.

The lowest yield of Montana was greater than the highest yield of North Dakota, Minnesota or Kansas by 66%.

The ~~lowest~~ highest yield of Montana was greater than the highest yield for the United States by 95%.

The drouth common to the northwestern States and Canadian provinces affected to some extent the yield of crops in Montana in 1910 but

other circumstances were equally effective in lowering the average yields. The very great increase in acreage in crops was on land newly broken; in many cases the preparation of the soil for the seed was not properly done, or the seeding was not done at the right time. Farming without irrigation in Montana demands farming by approved Montana dry farming methods as some new comers who did not follow them have learned. But notwithstanding these reasons for a shortage of crops, the results show that Montana passed through a trying season and emerged with average yields in all staple crops which place it in the first rank for productiveness. As the following table shows, Montana holds first place for both spring and winter wheat, oats, hay and potatoes:

Comparative yields for 1910, compiled from the Government Crop Reporter published by the Secretary of Agriculture, December, 1910.

STATE.	Bu. per Acre Winter Wheat.	Bu. per Acre Spring Wheat.	Bu. per Acre Oats.	Bu. per Acre Barley.	Bu. per Acre Flax Seed.	Bu. per Acre Corn.	Bu. per Acre Potatoes.	Tons per Acre Hay.
Illinois	15.0	....	38.0	30.2	....	39.1	75	1.33
Indiana	15.6	....	35.4	27.0	....	39.3	84	1.30
Iowa	21.2	20.9	37.8	29.5	12.2	36.3	72	1.05
Kansas	14.2	....	33.3	18.0	8.2	19.0	57	1.15
Michigan	18.0	....	34.0	26.0	....	32.4	105	1.30
Minnesota	....	16.0	28.7	21.0	7.5	32.7	61	1.00
Missouri	13.8	....	33.6	27.0	8.4	33.0	86	1.30
Nebraska	16.5	13.9	28.0	18.5	8.0	25.8	60	1.00
North Dakota	....	5.0	7.0	5.5	3.6	14.0	41	.55
Ohio	16.2	....	37.2	28.5	....	36.5	82	1 39
South Dakota	....	12.8	23.0	18.2	5.0	25.0	44	.80
Wisconsin	20.0	18.7	29.8	25.9	10.0	32.5	95	1.00
United States	15.8	11.7	31.9	22.4	4.8	27.4	94.4	1.33
Montana	22.0	22.0	38.0	28.0	7.0	23.0	120	1.40

The acreage of winter wheat reported for 1909-10 was 285,000 and the Department of Agriculture reports the acreage for 1910-11 as 387,000 and the condition 97.

The census reports for 1910 will give an approximately correct statement of the number of acres of orchards. They are increasing very rapidly. In 1899 the acreage in orchard fruits, chiefly apples, was given by the census as 5,571. It will be interesting to compare these figures with those for 1910 when the latter are known. The increase will be very great, and yet, this industry, so profitable and attractive, is in the infancy of its development, capable of almost indefinite expansion.

No accurate statistics for the State can be furnished until the census report is published but the following estimates are given for the counties named:

Carbon County.

Acres in fruit trees	15,000
Acreage of producing orchards	1,000
Number of trees	1,500,000
Boxes and bushels produced in 1910	20,000

Flathead County.

Acres in fruit trees	10,000
Acreage of producing orchards	1,500
Number of trees	1,000,000
Boxes produced in 1910	150,000
Carloads of apples shipped	75

Missoula County.

Acres in Orchards	7,500

Ravalli County.

Acres in fruit trees	33,000
Acreage in fruit trees producing	11,000
Number of trees	3,500,000
Cars of apples shipped	450

Sanders County.

Acreage in fruit trees	1,000
Acreage in producing orchards	500
Number of trees	800,000
Boxes and baskets produced in 1910	4,500

There are no returns from Yellowstone, or from other counties where many thrifty orchards, newly set out, will soon contribute materially to the output.

Montana agricultural exhibits win prizes in competition with the rest of the world wherever and whenever shown. The year 1909 was one of continued and repeated triumphs.

At the Spokane Apple Show, Ben Kress of Hamilton, Ravalli County, was awarded first prize for McIntosh Red Apples.

At the Dry Farming Congress, held at Billings, Willis Scott of Eureka, Lincoln County, was awarded the cup for the best exhibit of Turkey Red Wheat grown in Washington, Oregon or Montana, and Lohr Bros. of Tampico, Valley County, won the cup for the best alfalfa grown in those three States.

At the National Corn Exposition, held at Omaha, Montana exhibitors were notably successful. In the sweepstakes for wheat grown in the western portion of the United States the first prize was won by Gus Siegeling of Armington, Cascade County. In sweepstakes open to the world, H. F. Albrecht, of Kalispell, Flathead County, won first prize for the best sheaf of field peas. C. F. Booker of Helena, Lewis and Clark County, was first on marrow fat peas and Gus Siegling of Armington on navy beans.

At the Dry Farming Congress held at Spokane, October 3-6, 1910, the following first prizes were awarded to Montana exhibitors:

Best general display of dry farmed products from any U. S. Experimental Station under direction of employe of Bureau of Plant Industry, silver trophy, given by the Exposition Committee, to Judith Basin Experimental Station, Montana.

Wheat.

Best peck of Hard Spring Wheat, William Flannery, Belgrade, Gallatin County.

A MONTANA APPLE TREE

Best peck of Soft Spring Wheat, P. Carney, Waterloo, Madison County.

Best peck of Club Wheat, F. S. Sumner, Clyde Park, Park County.

Best display of Durum Wheat, John Forster, Grey Cliff, Sweet Grass County.

Best sheaf of Hard Winter Wheat, A. P. Smith, Hall, Granite County.

Oats.

Best display of oats, John Forster, Grey Cliff, Sweet Grass County.

Best peck of oats, other than medium white, A. P. Smith, Hall, Granite County.

Best sheaf of short White Oats, John Forster, Grey Cliff, Sweet Grass County.

Best sheaf of oats other than medium white, A. P. Smith, Hall, Granite County.

Silver Cup won by George Vetzer at Spokane Apple Show.

Barley.

Best peck of hulless (bald) barley, I. Wisner, Bozeman, Gallatin County.

Best sheaf of hulled (with hull)) barley, John Forster, Grey Cliff, Sweet Grass County.

Best sheaf of Hulless (bald) barley, John Forster, Grey Cliff, Sweet Grass County.

Rye.

Best peck of winter rye, George F. Pitts, Norris, Madison County.

Flax.

Best peck of flax, F. C. Sumner, Clyde Park, Park County.

Field Peas.

Best peck of Field Peas, O. H. Gilman, Twin Bridges, Madison County.

Apples.

Best box of McIntosh Red apples, silver cup, valued at $100.00, given by Lethbridge Board of Trade, Lethbridge, Alta., Canada, awarded to George Betzer, Somers, Flathead County, Montana.

Besides the staple crops those of lesser importance such as field peas, speltz, millet and others add considerably to the total value of crops produced.

All vegetables usual in the northern part of the United States grow profusely. Mining camps, towns and cities furnish convenient markets for vegetables and for small fruits. Currants, gooseberries, raspberries and strawberries flourish. Vegetables and fruits are disposed of in small lots, involving a great number of transactions for the year, but the total realized, if it could be ascertained, would be found to be a large sum.

The acreage in sugar beets is about 14,000, the production of about 12,000 acres being disposed of to the Beet Sugar Factory at Billings, the rest being fed to stock. If the average yield be estimated at 15 tons to the acre, and the average selling price at $5.00 per ton, the value of the beet sugar crop would amount to $1,050,000.

The state of Montana was granted 5,211,449 acres for public schools and 669,360 acres for higher institutions of learning and for miscellaneous purposes. A wise policy for the conservation of this great estate has been adopted. No land can be sold for less than $10 per acre. All lands are carefully appraised and after due notice are offered for sale at auction to the highest bidder at the county seat of the county in which they are located. If no offer is made to purchase the land at or above the sum fixed as the minimum selling price it then becomes subject to a lease at a rental that will yield not less than five percent on the appraised valuation. Some coal land has been leased on the royalty basis and permits to cut timber are granted to the highest bidder at auction at a price that shall never be less than $3 per thousand feet of live timber. A circular containing full information for prospective buyers or leasers of state lands will be mailed to any one interested on application to the Register of the State Land Office, Helena, Montana.

To aid in its construction the Northern Pacific Railway Company was granted 17,452,004 acres of land in Montana. Nearly thirty years have elapsed since September 8, 1883, when the golden spike which marked the completion of the road was driven at Gold Creek and the land grant is not yet adjusted. Up to July 1, 1910, 9,894,493 acres had been certified to the road. Millions of acres have been sold but millions remain in the ownership of the company. The welfare of the state would be promoted

if all the lands so lavishly granted to this corporation were promptly patented to it. If patented they might be sold, settled upon and cultivated and aid—not retard—the development of the state, or at least become subject to taxation.

Some Northern Pacific lands are for sale and information concerning them may be had on application to the Land Commissioner of the Northern Pacific Railway Company, St. Paul, Minn.

The area of unappropriated public lands July 1, 1908 was 46,532,440 acres, July, 1909, 42,900,229 acres and July 1, 1910, 36,015,943 acres. In two years 10,516,497 acres have been appropriated chiefly by homestead entrymen.

Of the 36,015,943 acres unappropriated at the end of the last fiscal year 17,226,811 acres were surveyed and 18,749,132 acres unsurveyed land. The following table gives the area of vacant land by land districts and counties, July 1, 1910, with description prepared in the land office:

VACANT PUBLIC LANDS.

Land district and county.	Area unappropriated and unreserved.			Brief description of character of unappropriated and unreserved land.
	Surveyed.	Unsurveyed.	Total.	
Billings:	Acres.	Acres.	Acres.	
Carbon	479,408	79,560	558,968	Farming, grazing, and mountainous.
Fergus	.....	1,000	1,000	Farming and grazing.
Rosebud	524,640	56,000	580,640	Do.
Yellowstone	738,308	510,260	1,248,568	Arid and mountainous.
Total	1,742,356	646,820	2,389,176	
Bozeman:				
Broadwater	27,810	12,160	39,970	Principally arid.
Carbon	113,903	10,880	124,783	One-third good farming; two-thirds mountainous.
Gallatin	66,114	11,840	77,954	One-fourth good farm land; three-fourths mountainous.
Jefferson	44,122	8,723	52,845	Principally arid.
Madison	145,128	113,627	258,755	One-fourth arid; three-fourths mountainous.
Park	99,349	20,787	120,136	One-third good farm land; two-thirds arid and mountainous.
Sweet Grass	327,782	10,240	338,022	Grazing and mountainous.
Yellowstone	55,084	.....	55,084	Arid and mountainous.
Total	879,292	188,257	1,067,549	
Glasgow:				
Dawson	234,899	1,103,651	1,338,550	Grazing and farming.
Valley	2,562,735	2,785,287	5,348,022	Agricultural and grazing.
Total	2,797,634	3,888,938	6,686,572	
Great Falls:				
Cascade	296,847	70,260	367,107	Grazing and agricultural.
Chouteau	638,920	12,960	651,880	Do.
Lewis and Clark	19,640	.....	19,640	Mountainous and agricultural.
Teton	730,294	217,200	947,494	Agricultural and grazing.
Total	1,685,701	300,420	1,986,121	

Land district and county.	Area unappropriated and unreserved. Surveyed.	Unsurveyed.	Total.	Brief description of character of unappropriated and unreserved land.
	Acres.	Acres.	Acres.	
Havre:				
Chouteau	1,536,405	2,009,305	3,545,710	Mountainous, grazing, and agricultural.
Helena:				
Beaverhead	326,556	224,701	551,257	Mountainous and grazing.
Broadwater	127,482	87,785	215,267	Mountainous and agricultural.
Cascade	16,722	14,133	30,855	Grazing and agricultural.
Deer Lodge	60,182	18,809	78,991	Mountainous, some agricultural
Gallatin	6,728	.....	6,728	Mountainous.
Granite	92,570	61,709	154,279	Do.
Jefferson	7,299	180,835	188,134	Mountainous, grazing, and agricultural.
Lewis and Clark	863,407	108,333	971,740	Do.
Madison	323,894	617,468	941,362	Do.
Meagher	234,097	70,030	304,127	Do.
Park	6,336	20,424	26,760	Do.
Powell	124,556	225,900	350,456	Mountainous, some agricultural
Silver Bow	83,339	16,299	99,638	Do.
Sweet Grass	10,087	.....	10,087	Do.
Teton	36,812	75,038	111,850	Do.
Total	2,320,067	1,721,464	4,041,531	
Kalispell:				
Flathead	3,629	.....	3,629	Valleys, mountainous, timber, grazing.
Lincoln	1,768	.....	1,768	Mountainous, timber land.
Total	5,397	.....	5,397	
Lewistown:				
Chouteau	102,431	17,234	119,665	Broken, grazing.
Dawson	206,385	341,000	547,385	Do.
Fergus	1,117,357	1,057,500	2,174,857	Grazing, farming, timber and mountainous.
Meagher	42,670	31,140	73,810	Farming and grazing.
Rosebud	24,716	152,950	177,666	Broken, grazing.
Sweet Grass	21,306	.....	21,306	Farming and grazing.
Yellowstone	85,547	.....	85,547	Grazing.
Total	1,600,412	1,599,824	3,200,236	
Miles City:				
Custer	2,401,431	2,775,834	5,177,265	Grazing and agricultural.
Dawson	1,064,297	3,612,829	4,677,126	Do.
Rosebud	1,034,251	463,345	1,497,596	Do.
Total	4,499,979	6,852,008	11,351,987	
Missoula:				
Beaverhead	3,260	60,014	63,274	Arid and grazing
Granite	33,509	13,365	46,874	Mountainous, timber, mineral.
Missoula	120,871	1,333,538	1,454,409	Small valleys, mountains, timber, and mineral.
Powell	12,086	19,320	31,406	Mountainous, timber, grazing, mineral.
Ravalli	1,657	97,654	99,311	Do.
Sanders	28,185	18,205	46,390	Agricultural, timber, mineral, mountainous.
Total	199,568	1,542,096	1,741,664	
State total	17,266,811	18,749,132	36,015,943	

One of the urgent needs of Montana is the extension of the surveys of public lands to every township within its borders; another is the definite determination of the status of land and the cessation of the practice of withdrawing and restoring, restoring and withdrawing, tracts of land with such frequency that it is extremely difficult even for the land offices to keep their records straight.

All business relating to the disposal of public lands must be trans-

Oats in the Gallatin Valley.

acted through the United States Land Office in the district in which the land involved is situated. Records of all entries and township plats and tract books may be consulted in the United States Land Offices at the following places; Billings, Bozeman, Glasgow, Great Falls, Havre, Helena, Kalispell, Lewistown, Miles City, and Missoula.

There are many laws under which public lands are disposed of. One circular of the General Land Office tells how mineral and another how coal lands may be acquired. Another circular states what it is necessary to do to acquire land under the desert land act. Timber and stone lands are sold under a special act. There are some special acts which govern the disposal of lands in Montana. Homesteads within reclamation projects are subject to the provisions of the national irrigation act.

Most of the 36,015,943 acres that were vacant July 1, 1910, are subject to homestead entry if surveyed. The enlarged homestead law, authorizing the entry of 320 acres, is generally applicable to the bench and prairie lands of eastern Montana. There have been designated as coal lands 20,208,865 acres whose surface rights may be included in homestead entries.

The law under which the vacant lands of Montana are being so rapidly taken up is the homestead law, tracts entered under other laws being relatively few, and for this reason it is thought advisable to give at length the last official circular of the General Land Office, dated September 24, 1910, on the subject:

SUGGESTIONS TO HOMESTEADERS AND PERSONS DESIRING TO MAKE HOMESTEAD ENTRIES.

Department of the Interior,
General Land Office,
Washington, D. C., September 24, 1910.

1. Persons desiring to make homestead entries should first fully inform themselves as to the character and quality of the lands they desire to enter, and should in no case apply to enter until they have visited and fully examined each legal subdivision for which they make application, as satisfactory information as to the character and occupancy of public lands can not be obtained in any other way.

As each applicant is required to swear that he is well acquainted with the character of the land described in his application, and as all entries are made subject to the rights of prior settlers, the applicant can not make the affidavit that he is acquainted with the character of the land, or be sure that the land is not already appropriated by a settler, until after he has actually inspected it.

Information as to whether a particular tract of land is subject to entry may be obtained from the register or receiver of the land district in which the tract is located, either through verbal or written inquiry, but these officers must not be expected to give information as to the character and quality of unentered land or to furnish extended lists of lands subject to entry, except through plats and diagrams which they are auth-

orized to make and sell as follows:

For a township diagram showing entered land only	$1.00
For a township plat showing form of entries, names of claimants, and character of entries	2.00
For a township plat showing form of entries, names of claimants, character of entry ,and number	3.00
For a township plat showing form of entries, names of claimants, character of entry, number, and date of filing or entry, together with topography, etc	4.00

Purchasers of township diagrams are entitled to definite information as to whether each smallest legal subdivision, or lot, is vacant public land. Registers and receivers are therefore required in case of an application for a township diagram showing vacant lands, to plainly check off with a cross, every lot or smallest legal subdivision in the township which is not vacant, leaving the vacant tracts unchecked. There is no authority for registers and receivers to charge and receive a fee of 25 cents for plats and diagrams of a section or part of a section of a township.

If because of the pressure of current business relating to the entry of lands registers and receivers are unable to make the plats or diagrams mentioned above, they may refuse to furnish the same and return the fee to the applicant, advising him of their reason for not furnishing the plats requested, that he may make the plats or diagrams himself, or have same made by his agent or attorney, and that he may have access to the plats and tract books of the local land office for this purpose, provided such use of the records will not interfere with the orderly dispatch of the public business.

A list showing the general character of all public lands remaining unentered in the various counties of the public-land States on the 30th day of the preceding June may be obtained at any time by addressing "The Commissioner of the General Land Office, Washington, D. C."

All blank forms of affidavits and other papers needed in making application to enter or in making final proofs can be obtained by applicants and entrymen from the land office for the district in which the land lies.

2. Kind of Land Subject to Homestead Entry.—All unappropriated surveyed public lands adaptable to any agricultural use are subject to homestead entry if they are not mineral or saline in character and are not occupied for the purposes of trade or business and have not been embraced within the limits of any withdrawal, reservation, or incorporated town or city; but homstead entries on lands within certain areas (such as lands in Alaska, lands withdrawn under the reclamation act, certain ceded Indian lands, lands within abandoned military reservations, agricultural lands within national forests, lands in western and central Nebraska, and lands withdrawn, classified, or valuable for coal) are made subject to the particular requirements of the laws under which such lands are opened to entry. None of these particular requirements are set out in these suggestions, but information as to them may be obtained by either verbal or written inquiries addressed to the register and receiver of the land office of the district in which such lands are situated.

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How Claims Under the Homestead Law Originate.

3. Claims under homestead laws may be initiated either by settlement on surveyed or unsurveyed lands of the kind mentioned in the foregoing paragraph, or by the filing of a soldier's or sailor's declaratory statement, or by the presentation of an application to enter any surveyed lands of that kind.

4. Settlements May Be Made Under the Homestead Laws by all persons qualified to make either an original or a second homestead entry, as explained in paragraphs 6 and 13, and in order to make settlement a settler must personally go upon and improve or establish residence on the land he desires. By making settlement in this way the settler gains the right to enter the land settled upon as against all other persons, but not as against the Government should the land be withdrawn by it for other purposes.

A settlement made on any part of a surveyed technical quarter section gives the settler the right to enter all of that quarter section which is then subject to settlement, although he may not place improvements on each 40-acre subdivision; but if the settler desires to initiate a claim to surveyed tracts which form a part of more than one technical quarter section he should perform some act of settlement—that is, make some improvement—on each of the smallest legal subdivisions desired. When settlement is made on unsurveyed lands, the settler must plainly mark the boundaries of all the lands claimed by him.

The settlement must be made by the settler in person, and cannot be made by his agent, and each settler must, within a reasonable time after making his settlement, establish and thereafter continuously maintain an actual residence on the land, and if he fails to do this, or, in case of his death, his widow, heirs, or devisees fail to continue cultivation or residence, or if he, or his widow, heirs, or devisees, fail to make entry within three months from the time he first settles on surveyed land, or within three months from the filing in the local land office of the plat of survey of unsurveyed lands on which he made settlement, the right of making entry of the lands settled on will be lost in case of an adverse claim, and the land will become subject to entry by the first qualified applicant.

5. Soldiers' and Sailors' Declatory Statements may be filed in the land office for the district in which the lands desired are located by any persons who may have been honorably dischorged after ninety days' service in the army or navy of the United States during the war of the rebellion or during the Spanish-American war or the Phillippine insurrection. Declaratory statements of this character may be filed either by the soldier or sailor in person or through his agent acting under a proper power of attorney, but the soldier or sailor must make entry of the land in person, and not through his agent, within six months from the filing of his declaratory statement, or he may make entry in person without first filing a declaratory statement if he so chooses. If a declaratory statement is filed by a soldier or sailor in person, it must be executed

by him before one of the officers mentioned in paragraph 16, in the county or land district in which the land is situated; if filed through an agent, the affidavit of the agent must be executed before one of the officers above mentioned, but the soldiers' affidavit may be executed before any officer using a seal and authorized to administer oaths and not necessarily within the county or land district in which the land is situated.

By Whom Homestead Entries May Be Made.

6. Homestead entries may be made by any person who does not come within either of the following classes:

(a) Married women, except as hereinafter stated.

(b) Persons who have already made homestead entry, except as hereinafter stated.

(c) Foreign-born persons who have not declared their intention to become citizens of the United States.

(d) Persons who are the owners of more than 160 acres of land in the United States.

(e) Persons under the age of 21 years who are not the heads of families, except minors who make entry as heirs, as hereinafter mentioned, or who have served in the army or navy during the existence of an actual war for at least fourteen days.

(f) Persons who have acquired title to or are claiming under any of the agricultural public-land laws, through settlement or entry made since August 30, 1890, any other lands which, with the lands last applied for, would amount in the aggregate to more than 320 acres. See, however, modification hereof in the regulations concerning enlarged homestead entries under the act of February 19, 1909 (par. 52).

7. A Married Woman, who has all of the other qualifications of a homesteader, may make a homestead entry under any one of the following conditions:

(a) Where she has been actually deserted by her husband.

(b) Where her husband is incapacitated by disease or otherwise from earning a support for his family and the wife is really the head and main support of the family.

(c) Where the husband is confined in a penitentiary and she is actually the head of the family.

(d) Where the married woman is the heir of a settler or contestant who dies before making entry.

(e) Where a married woman made improvements and resided on the lands applied for before her marriage, she may enter them after marriage if her husband is not holding other lands under an unperfected homestead entry at the time she applies to make entry.

8. If An Entryman Deserts His Wife, and abandons the land covered by his entry, his wife then has the exclusive right to contest the entry if she has continued to reside on the land, and on securing its cancellation she may enter the land in her own right, or she may continue her resi-

dence and make proof in the name of and as the agent for her husband, and patent will issue to him.

9. If An Entryman Deserts His Minor Children and abandons his entry after the death of his wife, the children have the same rights the wife could have exercised had she been deserted during her lifetime.

10. The Marriage of the Entrywoman After Making Entry will not defeat her right to acquire title if she continues to reside upon the land and otherwise comply with the law. A husband and wife can not, however maintain separate residences on homestead entries held by each of them, and if, at the time of marriage, they are each holding an unperfected entry on which they must reside in order to acquire title, they can not hold both entries. In such case they may elect which entry they will retain, and relinquish the other.

11. A Widow, if otherwise qualified, may make a homestead entry notwithstanding the fact that her husband made an entry, and notwithstanding she may be at the time claiming the unperfected entry of her deceased husband.

12. A Person Serving in the Army or Navy of the United States may make a homestead entry if some member of his family is residing on the lands applied for, and the application and accompanying affidavits may be executed before the officer commanding the branch of the service in which he is engaged.

13. Second Homestead Entries may be made by the following classes of persons, if they are otherwise qualified to make entry:

(a) By a former entryman who commuted his entry prior to June 5, 1900.

(b) By a homestead entryman who, prior to May 17, 1900, paid for lands to which he would have been afterwards entitled to receive patent without payment, under the "free-homes act." (Appendix No. 3.)

(c) By any person who for any cause lost, forfeited, or abandoned his homestead entry before February 8, 1908, if the former entry was not canceled for fraud or relinquished for valuable consideration. Where an entryman sells his improvements on the land and relinquishes his entry in connection therewith, or if he receives the amount of his filing fees or any other amount, it is held that he relinquishes for a valuable consideration.

(d) By persons whose original entries have failed because of the discovery subsequent to entry of obstacles which could not have been foreseen and which render it impracticable to cultivate the land, or because, subsequent to entry, the land becomes useless for agricultural purposes through no fault of the entryman. There is not specific statute authorizing the making of second entries in these classes of cases, and such entries are allowed under the general equitable power of the land department to grant relief in cases of accident and mistake.

(e) Any person who has already made final proof for less than 160 acres under the homestead laws may, if he is otherwise qualified, make

a second or additional entry for such an amount of public land as will, when added to the amount for which he has already made proof, not exceed in the aggregate 160 acres. See, however, instructions under the enlarged homestead act (par. 52).

Any person desiring to make a second entry must first select and inspect the lands he intends to enter and then make application therefor on blanks furnished by the register and receiver. Each application must state the date and number of his former entry and the land office at which it was made, or give the section, township, and range in which the land entered was located. Any person mentioned in paragraph (c) above must show, by oaths of himself and some other person or persons, the time when his former entry was lost, forfeited, or abandoned, and that it was not canceled for fraud or abandoned or relinquished for a valuable consideration.

Any person mentioned in paragraph (d) above must, in addition to the above evidence as to date and description of his former entry, date of abandonment, and receipt of no consideration, show, by duly corroborated affidavit, the grounds on which he seeks relief, and that he used due diligence prior to entry to avoid any mistake.

14. An Additional Homestead Entry may be made by a person for such amount of public lands adjoining lands then held and resided upon by him under his original entry as will, when added to such adjoining lands, not exceed in the aggregate 160 acres. An entry of this kind may be made by any person who has not acquired title to and is not, at the date of his application, claiming under any of the agricultural public land laws, through settlement or entry made since August 30, 1890, any other lands which, with the land then applied for, would exceed in the aggregate 320 acres, but the applicant will not be required to show any of the other qualifications of a homestead entryman. See, however, instructions under the enlarged homestead act (par. 50).

15. An Adjoining Farm Entry may be made for such an amount of public lands lying contiguous to lands owned and resided upon by the applicant as will not, with the lands so owned and resided upon, exceed in the aggregate 160 acres; but no person will be entitled to make entry of this kind who is not qualified to make an original homestead entry. A person who has made one homestead entry, although for a less amount than 160 acres, and perfected title thereto is not qualified to make an adjoining farm entry.

How Homestead Entries Are Made.

16. A homestead entry may be made by the presentation to the land office of the district in which the desired lands are situated of an application properly prepared on blank forms prescribed for that purpose and sworn to before either the register or the receiver, or before a United States commissioner, or a United State court commissioner, or a judge, or a clerk of a court of record, in the county or parish in which the land lies, or before any officer of the classes named who resides in the land district and nearest and most accessible to the

land, although he may reside outside of the county in which the land is situated.

17. Each application to enter and the affidavits accompanying it must recite all the facts necessary to show that the applicant is acquainted with the land; that the land is not, to the applicant's knowledge, either saline or mineral in character; that the applicant possesses all of the qualifications of a homestead entryman: that the application is honestly and in good faith made for the purpose of actual settlement and cultivation, and not for the benefit of any other person, persons, or corporation; that the applicant will faithfully and honestly endeavor to comply with the requirements of the law as to settlement, residence and cultivation necessary to acquire title to the land applied for; that the applicant is not acting as the agent of any person, persons, corporation, or syndicate in making such entry, nor in collusion with any person, corporation, or syndicate to give them the benefit of the land entered or any part thereof; that the application is not made for the purpose of speculation, but in good faith to obtain a home for the applicant, and that the applicant has not directly or indirectly made, and will not make, any agreement or contract in any way or manner with any person or persons, corporation, or syndicate whatsoever by which the title he may acquire from the Government to the lands applied for shall inure, in whole or in part, to the benefit of any person except himself.

18. All applications to make second homestead entries must, in addition to the facts specified in the preceding paragraph, show the number and date of the applicant's original entry, the name of the land office where the original entry was made, and the description of the land covered by it, and it should state fully all of the facts which entitle the applicant to make a second entry.

19. All applications by persons claiming as settlers must, in addition to the facts required in paragraph 17, state the date and describe the acts of settlement under which they claim a preferred right of entry, and applications by the widows, devisees, or heirs of settlers must state facts showing the death of the settler and their right to make entry; that the settler was qualified to make entry at the time of his death, and that the heirs or devisees applying to enter are citizens of the United States or have declared their intentions to become such citizens, but they are not required to state facts showing any other qualifications of a homestead entryman, and the fact that they have made a former entry will not prevent them from making an entry as such heirs or devisees, nor will the fact that a person has made entry as the heir or devisee of the settler prevent him from making an entry in his own individual right, if he is otherwise qualified to do so.

20. All applications by soldiers, sailors, or their widows, or the guardians of their minor children should be accompanied by proper evidence of the soldier's or sailor's service and discharge, and of the fact that the soldier or sailor had not, prior to his death, made an entry in his own right. The application of the widow of the soldier or sailor

must also show that she is unmarried, and that the right has not been exercised by any other person. Applications for the children of soldiers or sailors must show that the father died without having made entry, that the mother died or remarried without making entry, and that the person applying to make entry for them is their legally appointed guardian.

Rights of Widows, Heirs, or Devisees Under the Homestead Laws.

21. If a homestead settler dies before he makes entry, his widow has the exclusive right to enter the lands covered by his settlement, and if there be no widow, then any person to whom he has devised his settlement rights by proper will has the exclusive right to make the entry; but if the settler dies leaving neither widow nor will, then the right to enter the lands covered by his settlement passes to the persons who are named as heirs by the laws of the State in which the land lies. The persons to whom the settler's right of entry passes must make entry within the time named in paragraph 4 or they will forfeit their right to the next qualified applicant. They may, however, make entry after that time if no adverse claim has attached.

22. If a homestead entryman dies before making final proof his rights under his entry will pass to his widow; or if there be no widow, and the entryman's children are all minors, the right to a patent vests in them upon making publication of notice and proof of the death of the entryman without a surviving widow, that they are the only minor children and that there are no adult heirs of the entryman, or the land may be sold for the benefit of such minor children in the manner in which other lands belonging to minors are sold under the laws of the State or Territory in which the lands are located.

If the children of a deceased entryman are not all minors and his wife is dead, his rights under his entry pass to the person to whom such rights were devised by the entryman's will, or if an entryman dies without leaving either a widow or a will, and his children are not all minors, his rights under his entry will pass to the persons who are his heirs under the laws of the State or Territory in which the lands are situated.

23. If a contestant dies after having secured the cancellation of an entry his right as a successful contestant to make entry passes to his heirs; and if the contestant dies before he has secured the cancellation of the entry he has contested, his heirs may continue the prosecution of his contest and make entry if they are successful in the contest. In either case to entitle the heirs to make entry they must show that the contestant was a qualified entryman at the date of his death; and in order to earn a patent the heirs must comply with all the requirements of the law under which the entry was made to the same extent as would have been required of the contestant had he made entry.

No foreign-born persons can claim rights as heirs under the homestead laws unless they have become citizens of the United States or have declared their intentions to become citizens.

24. The unmarried widow, or, in case of her death or remarriage,

the minor children of soldiers and sailors who were honorably discharged after ninety days' actual service during the war of the rebellion, the Spanish-American war, or the Philippine insurrection may make entry as such widow or minor children if the soldier or sailor died without making entry. The minor children must make a joint entry through their duly appointed guardian.

Residence and Cultivation.

25. The residence and cultivation required by the homestead law means a continuous maintenance of an actual home on the land entered, to the exclusion of a home elsewhere, and continuous annual cultivation of some portion of the land. A mere temporary sojourn on the land, followed by occasional visits to it once in six months or oftener, will not satisfy the requirements of the homestead law, and may result in the cancellation of the entry.

26. No specific amount of either cultivation or improvements is required where entry is made under the general homestead law, but there must in all cases be such continuous improvement and such actual cultivation as will show the good faith of the entryman. Lands covered by such a homestead entry may be used for grazing purposes if they are more valuable for pasture than for cultivation to crops. When lands of this character are used for pasturage, actual grazing will be accepted in lieu of actual cultivation. The fact that lands covered by homesteads are of such a character that they can not be successfully cultivated or pastured will not be accepted as an excuse for failure to either cultivate or graze them.

Homestead Entries for Coal Lands.—Where homestead entry is made under the act of June 22, 1910 (36 Stat., 583), for land which has been withdrawn or classified as coal land, or which is valuable for coal, the entryman must show improvements as above stated and must further comply with the requirements of the enlarged homestead act of February 19, 1909 (35 Stat., 639), as to residence and cultivation; that is, he must cultivate at least one-eighth of the area of the entry to agricultural crops other than native grasses, beginning with the second year of the entry, and at least one-fourth of the area of the entry beginning with the third year of the entry and continuing to the date of proof. Entries in this class can not be commuted. (See par. 51.)

27. Actual residence on the lands entered must begin within six months from the date of all homestead entries, except additional entries and adjoining farm entries of the character mentioned in paragraphs 14 and 15, and residence with improvements and annual cultivation must continue until the entry is five years old, except in cases hereafter mentioned; but all entrymen who actually resided upon the cultivated lands entered by them prior to making such entries may make final proof at any time after entry when they can show five years' residence and cultivation.

Under certain circumstances, leaves of absence may be granted in the manner pointed out in paragraph 36 of these suggestions, but the

entryman can not claim credit for residence during the time he is absent under such leave.

An extension of time for establishing residence can be granted only in cases where the entryman is actually prevented by climatic hindrances from establishing his residence within the required time. This extension can not be granted in advance; but on making final proof or in case a contest is instituted against the entry the entryman may show the storms, floods, blockades of snow or ice, or other climatic reasons which rendered it impossible for him to commence residence within six months from date of entry, and he must as soon as possible after the climatic hindrances disappear establish his residence on the land entered. Failure to establish residence within six months from date of entry will not necessarily result in a forfeiture of the entry, provided the residence be established prior to the intervention of an adverse claim.

After an entryman has fully complied with the law and has submitted proof he is no longer required to live on the land. But all entrymen should understand that if they discontinue their residence on the land prior to the issuance of patent they do so at their risk, and by so doing may place themselves in such a position that they may be unable to comply with requirements made by the General Land Office, should their proof on examination there be found unsatisfactory.

28. Residence and cultivation by soldiers and sailors of the classes mentioned in paragraph 5 must begin within six months from the time they file their declaratory statements regardless of the time when they make entry under such statement, but if they make entry without filing a declaratory statement they must begin their residence within six months from the date of such entry, and residence thus established must continue in good faith, with improvements and annual cultivation for at least one year, but after one year's residence and cultivation the soldier or sailor is entitled to credit on the remainder of the five-year period for the term of his actual naval or military service, or if he was discharged from the army or navy because of wounds received or disabilities incurred in the line of duty he is entitled to credit for the whole term of his enlistment. No credit can be allowed for military service where commutation proof is offered.

29. A soldier or sailor making entry during his enlistment in time of peace is not required to reside personally on the land, but may receive patent if his family maintain the necessary residence and cultivation until the entry is five years old or until it has been commuted; but a soldier or sailor is not entitled to credit on account of his military service in time of peace. And if such soldier has not family, there is no way by which he can make entry and acquire title during his enlistment in time of peace.

30. Widows and minor orphan children of soldiers and sailors who make entry as such widows and children must begin their residence and cultivation of the lands entered by them within six months from

the dates of their entries, or the filing of declaratory statement, and thereafter continue both residence and cultivation for such period as will, when added to the time of their husbands' or fathers' military or naval service, amount to five years from the date of the entry, and if the husbands or fathers either died in the service or were discharged on account of wounds or disabilities incurred in the line of duty, credit for the whole term of their enlistment, not to exceed four years, may be taken, but no patent will issue to such widows or children until there has been residence and cultivation by them for at least one year. No credit can be allowed for military service where commutation proof is offered.

31. Persons who make entry as heirs of settlers are not required to both reside upon and cultivate the land entered by them, but they must, within six months from the dates of their entries, begin and thereafter continuously maintain either residence or cultivation on the land entered by them for such a period of time as, added to the time during which the settler resided on and cultivated the land, will make five years, unless their entries be sooner commuted. Commutation proof can not, however, be made unless at least fourteen months' actual residence is shown, performed either by the settler or the heirs or in part by the settler and in part by the heirs.

32. The widow, heirs, or devisees of a homestead entryman who dies before he earns patent are not required to both reside upon and cultivate the lands covered by his entry, but they must, within six months after the death of the entryman, begin either residence or cultivation on the land covered by the entry, and thereafter continously maintain either residence or cultivation for such a period of time as will, when added to the time during which the entryman complied with the law, amount in the aggregate to the required five years, unless they sooner commute the entry. But commutation proof can not be made unless fourteen months' actual residence can be shown, performed by the entryman or by the widow, heirs, or devisees, or in part by the entryman and in part by the widows, heirs, or devisees.

33. Homestead entrymen who have been elected to either a federal, state, or county office, after they have made entry and stablished an actual residence on the land covered by their entries are not required to continue such residence during their term of office, if the discharge of their bona fide official duties necessarily requires them to reside elsewhere than upon the land; but they must continue their cultivation and improvements for the required length of time. Such an office-holder can not commute, however, unless he can show at least fourteen months' actual residence. See circulars of February 16 and 20, 1909 (Appendix No. 13), and October 18, 1907 (Appendix No. 14).

A person who makes entry after he has been elected to office is not excused from maintaining residence, but must comply with the law in the same manner as though he had not been elected.

34. Residence is not required on land covered by an adjoining farm entry of the kind mentioned in paragraph 15; but a person who makes an adjoining farm entry is not entitled to a patent until he has continued his residence and cultivation for the full five years on the land owned by him at the time he made entry, or on the adjoining lands entered by him, unless he commutes his entry after fourteen months' residence on either the entered lands or the lands originally owned by him; in neither case can credit be claimed for residence on the original farm prior to the date of the adjoining farm entry.

A person who has made an additional entry of the kind mentioned in paragraph 14 for lands adjoining his original entry is not entitled to patent for the lands so entered until he can show five years' residence, either on the original entry or in part on the original and in part on the additional. No commutation of the additional entry is allowed by law in the latter case.

35. Neither residence nor cultivation by an insane homestead entryman is necessary after he becomes insane, if such entryman made entry and established residence before he became insane and complied with the requirements of the law up to the time his insanity began.

Leaves of Absence.

36. Leaves of absence for one year or less may be granted to entrymen who have established actual residence on the lands entered by them in all cases where total or partial failure or destruction of crops, sickness, or other unavoidable casualty has prevented the entryman from supporting himself and those dependent upon him by a cultivation of the land.

Applications for leaves of absence should be addressed to the register and receiver of the land office where the entry was made and should be be sworn to by the applicant and some other disinterested person before such register and receiver or before some officer in the land district using a seal and authorized to administer oaths, except in cases where, through age, sickness, or extreme poverty, the entryman is unable to visit the district for that purpose, when the oath may be made outside of the land district. All applications of this kind should clearly set forth:

(a) The number and date of the entry, a description of the lands entered, the date of the establishment of his residence on the land, and the extent and character of the improvements and cultivation made by the applicant.

(b) The kind of crops which failed or were destroyed and the cause and extent of such failure or destruction.

(c) The kind and extent of the sickness, disease, or injury assigned, and the extent to which the entryman was prevented from continuing his residence upon the land, and, if practicable, a certificate signed by a reliable physician as to such sickness, disease, or injury, should be furnished.

(d) The character, cause, and extent of any unavoidable casualty which may be made the basis of the application.

(e) The dates from which and to which the leave of absence is requested.

Commutation of Homestead Entries.

37. All original, second, and additional homestead, and adjoining far mentries may be commuted, except such entries as are made under particular laws which forbid their commutation.

Where there has been immediately prior to the application to submit proof on a homestead entry at least fourteen months' actual and substantial continuous residence, accompanied by improvement and cultivation, the entryman, or his widow, heirs, or devisees, may obtain patent by proving such residence, improvement, and cultivation, and paying the cost of such proof, the land office fees, and the price of the land, which is $1.25 per acre outside the limits of railroad grants, and $2.50 per acre for lands within the granted limits, except as to certain lands which were opened under statutes requiring payment of a price different from that here mentioned. See circular of October 18, 1907 (Appendix No. 14).

Commutation proof can not be made on homestead entries allowed under the act of April 28, 1904 (33 Stat., 547), known as the Kinkaid act; entries under the Reclamation Act of June 17, 1902 (32 Stat., 388); entries under the enlarged homestead act (post par. 46 et seq.); entries allowed for coal lands under the act of June 22, 1910 (36 Stat., 583), so long as the land is withdrawn or classified as coal; additional entries allowed under the act of April 28, 1904 (33 Stat., 527, Appendix No. 4); second entries allowed under the act of June 5, 1900 (31 Stat. 267, Appendix No. 5); or second entries allowed under the act of May 22, 1902 (32 Stat., Appendix No. 5), when the former entry was commuted.

Homestead Final and Commutation Proof.

38. Either final or commutation proof may be made at any time when it can be shown that residence and cultivation have been maintained in good faith for the required length of time, but if final proof is not made within seven years from the date of a homestead entry the entry will be canceled unless some good excuse for the failure to make the proof within the seven years is given with satisfactory final proof as to the required residence and cultivation made after the expiration of the seven years.

39. By Whom Proof May Be Offered.—Final proof must be made by the entrymen themselves, or by their widows, heirs, or devisees, and can not be made by their agents, attorneys in fact, administrators, or executors, except in the cases hereinafter mentioned. In order to submit final five-year proof the entryman, his widow, or the heir or devisee submitting proof must be a citizen of the United States. As a general rule commutation proof may be submitted by one who has declared his or her intention to become a citizen, but on entries made for land in certain reservations opened under special acts the person submitting commutation proof must be a citizen of the United States.

(a) If an entryman becomes insane after making his entry and establishing residence, patent will issue to the entryman on proof by his guardian or legal representative that the entryman had complied with the law up to the time his insanity began. In such a case if the

entryman is an alien and has not been fully naturalized evidence of his declaration of intention to become a citizen is sufficient.

(b) If a person has made a homestead entry and afterwards died while he was serving as a soldier or a sailor during the Spanish-American war or the Philippine insurrection, patent will issue upon proof made by his widow, if unmarried, or in case of her death or marriage then his minor orphan children, or his, her, or their legal representatives.

(c) Where entries have been made for minor orphan children of soldiers or sailors, proof may be offered by their guardian, if any, if the children are still minors at the time the proof should be made.

(d) When an entryman has abandoned the land covered by his entry and deserted his wife, she may make final or commutation proof as his agent, or, if his wife be dead and the entryman has deserted his minor children, they may make the same proof as his agent, and patent will issue in the name of the entryman.

(e) When an entryman dies leaving children, all of whom are minors, and both parents are dead, the executor or administrator of the entryman, or the guardian of the children, may, at any time within two years after the death of the surviving parent, sell the land for the benefit of the children by proper proceedings in the proper local court, and patent will issue to the purchaser; but if the land is not sold patent will issue to the minors upon proof of death, heirship, and minority being made by such administrator or guardian.

40. How Proofs May Be Made.—Final or commutation proofs may be made before any of the officers mentioned in paragraph 16, as being authorized to administer oaths to applicants.

Any person desiring to make homestead proof should first forward a written notice of his desire to the register and receiver of the land office, giving his post-office address, the number of his entry, the name and official title of the officer before whom he desires to make proof, the place at which the proof is to be made, and the name and post-office addresses of at least four of his neighbors who can testify from their own knowledge as to facts which will show that he has in good faith complied with all the requirements of the law.

41. Publication Fees.—Applicants shall hereafter be required to make their own contracts for publishing notice of intention to make proof, and they shall make payment therefor directly to the publishers, the newspaper being designated and the notice prepared by the register.

42. Duty of Officers Before Whom Proofs Are Made.—On receipt of the notice mentioned in the preceding paragraph, the register will issue a notice naming the time, place, and officer before whom the proof is to be made and cause the same to be published once a week for five successive weeks in a newspaper of established character and general circulation published nearest the land, and also post a copy of the notice in a conspicuous place in his office.

On the day named in the notice the entryman must appear before the officer designated to take proof with at least two of the witnesses

named in the notice; but if for any reason the entryman and his witnesses are unable to appear on the date named, the officer should continue the case from day to day until the expiration of ten days, and the proof may be taken on any day within that time when the entryman and his witnesses appear, but they should, if it is at all possible to do so, appear on the day mentioned in the notice. Entrymen are advised that they should, whenever it is possible to do so, offer their proofs before the register or receiver, as it may be found necessary to refer all proofs made before other officers to a special agent for investigation and report before patent can issue, while, if the proofs are made before the register and receiver, there is less likelihood of this being done, and there is less probability of the proofs being incorrectly taken. By making proof before the register or receiver the entryman will also save the fees which they are required to pay other officers, as they will be required under the law to pay the register and receiver the same amount of fees in each case, regardless of the fact that the proof may have been taken before some other officer.

Entrymen are cautioned against improvidently and improperly commuting their entries, and are warned that any false statement made in either their commutation or final proof may result in their indictment and punishment for the crime of perjury.

43. Fees and Commissions.—When a homesteader applies to make entry he must pay in cash to the receiver a fee of $5 if his entry is for 80 acres or less, or $10 if he enters more than 80 acres. And in addition to this fee he must pay, both at the time he makes entry and final proof, a commission of $1 for each 40-acre tract entered outside of the limits of a railroad grant and $2 for each 40-acre tract entered within such limits. Fees under the enlarged homestead act are the same as above, but the commissions are based upon the area of the land embraced in the entry (see par. 48). On all final proofs made before either the register or receiver, or before any other officer authorized to take proofs, the register and receiver are entitled to receive 15 cents for each 100 words reduced to writing, and no proof can be accepted or approved until all fees have been paid.

In all cases where lands are entered under the homestead laws in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, the commission due to the register and receiver on entries and final proofs, and the testimony fees under final proofs, are 50 per cent more than those above specified, but the entry fee of $5 or $10, as the case may be, remains the same in all the States.

United States commissioners, United States court commissioners, judges, and clerks are not entitled to receive a greater sum than 25 cents for each oath administered by them, except that they are entitled to receive $1 for administering the oath to each entryman and each final proof witness to final proof testimony, which has been reduced to writing by them.

44. The alienation of all or any part of the land embraced in a

homestead prior to making proof, except for the public purposes mentioned in section 2288, Revised Statutes (see Appendix No. 1), will prevent the entryman from making satisfactory proof, since he is required to swear that he has not alienated any part of the land except for the purposes mentioned in section 2288, Revised Statutes.

A mortgage by the entryman prior to final proof for the purpose of securing money for improvements, or for any other purpose not inconsistent with good faith, is not considered such an alienation of the land as will prevent him from submitting satisfactory proof. In such a case, however, should the entry be canceled for any reason prior to patent, the mortgagee would have no claim on the land or against the United States for the money loaned.

Alienation After Proof and Before Patent.—The right of a homestead entryman to patent is not defeated by the alienation of all or a part of the land embraced in his entry after the submission of final proof and prior to patent, provided the proof submitted is satisfactory. Such an alienation is, however, at the risk of the entryman, for if the reviewing officers of the land department subsequently find the final proof so unsatisfactory that it must be wholly rejected and new proof required, the entryman can not the truthfully make the nonalienation affidavit required by section 2291, Revised Statutes, and his entry must in consequence be canceled. The purchaser takes no better title than the entryman had, and if the entry is canceled purchaser's title must necessarily fail.

45. Relinquishments.—A homestead entryman, or in case of his death, his statutory successor, as explained in paragraph 22, may file a written relinquishment of his entry, and on the filing of such relinquishment in the local land office the land formerly covered by the entry becomes at once subject to entry by the first qualified applicant.

Relinquishments run tothe United States alone, and no person obtains any right to the land by the mere purchase of a relinquishment of a filing or entry.

Entries made for the purpose of holding the land for speculation and sale of the relinquishments are illegal and fraudulent. Every effort will be made to prevent such frauds and to detect and punish the perpetrators.

Purchasers of relinquishments of fraudulent filings or entries should understand that they purchase at their own risk so far as the United States is concerned, and they must seek their own remedies under local laws against those who by imposing such relinquishments upon them have obtained their money without valuable consideration.

Enlarged Homestead Entries.

46. Kind of Land Subject to Entry.—The first section of the act of February 19, 1909 (35 Stat., 639; see Appendix No. 15), provides for the making of homestead entries for an area of 320 acres, or less, of nonmineral, nontimbered, nonirrigable public land in the States of Colorado, Montana, Nevada, Oregon, Utah, Washington, Wyoming, and in the Territories of Arizona and New Mexico. By the first section of the act approved June 17, 1910 (36 Stat., 531; see Appendix No. 15), the same

kind of entries are allowed to be made in the Stateof Idaho.

The terms "arid" or "nonirrigable" land, as used in these acts, are construed to mean land which, as a rule, lacks sufficient rainfall to produce agricultural crops without the necessity of resorting to unusual methods of cultivation, such as the system commonly known as "dry farming," and for which there is no known source of water supply from which such land may be successfully irrigated at a reasonable cost.

Therefore lands containing merchantable timber, mineral lands, and lands within a reclamation project, or lands which may be irrigated at a reasonable cost from any known source of water supply, may not be entered under these acts. Minor portions of a legal subdivision susceptible of irrigation from natural sources, as, for instance, a spring, will not exclude such subdivision from entry under these acts, provided, however, that no one entry shall embrace in the aggregate more than 40 acres of such irrigable lands.

47. Designation of Lands.—From time to time lists designating the lands which are subject to entry under these acts are sent to the registers and receivers in the States affected, and they are instructed immediately upon the receipt of such lists to note the same upon their tract books. Until such lists have been received by them no applications to enter can be received and no entries allowed under these acts, but after the receipt of such lists it is competent for them to dispose of applications for land embraced therein under the provisions of these acts, in like manner as other applications for public lands.

The fact that lands have been designated as subject to entry is not conclusive as to the character of such lands, and should it afterwards develop that the land is not of the character contemplated by the above acts the designation may be canceled; but where an entry is made in good faith under the provisions of these acts, such designation will not thereafter be modified to the injury of anyone who, in good faith, has acted upon such designation. Each entryman must furnish affidavit as required by section 2 of the acts.

48. Compactness—Fees.—Lands entered under the enlarged homestead acts must be in a reasonably compact form and in no event exceed 1½ miles in length.

The acts provide that the fees shall be the same as those now required to be paid under the homestead laws; therefore, while the fees may not in any one case exceed the maximum fee of $10 required under the general homestead law, the commissions will be determined by the area of the land embraced in the entry.

49. Form of Application.—Applications to make entry under these acts must be submitted on forms prescribed by the General Land Office, and in case of an original entry on No. 4-003.

The affidavit of an applicant as to the character of the land must be corroborated by two witnesses. It is not necessary that such witnesses be acquainted with the applicant, and if they are not so acquainted their affidavits should be modified accordingly.

50. Additional Entries.—Sections 3 of the acts provide that any homestead entrymen of lands of the character described in the first sections of the act, upon which entry final proof has not been made, may enter such other lands subject to the provisions of the acts, contiguous to the former entry, which shall not, together with the lands embraced in the original entry, exceed 320 acres, and that residence upon and cultivation of the original entry shall be accepted as equivalent to residence upon and cultivation of the additional entry.

These sections contemplate that lands may, subsequent to entry, be classified, or designated, by the Secretary of the Interior as falling within the provisions of these acts, and in such cases an entryman of such lands may, at any time prior to final proof on his original entry, make such additional entry, provided he is otherwise qualified. Applicants for such additional entries must tender the proper fees and commissions, and make application and affidavit on the form prescribed (No. 4-004). Entrymen who have made final proof on their original entries, are not qualified to make additional entries.

51. Final Proof on Original and Additional Entries—Commutation Not Allowed.—Final proof must be made as in ordinary homestead cases, and in addition to the showing required of ordinary homestead entrymen it must be shown that at least one-eighth of the area embraced in each entry has been continuously cultivated to agricultural crops other than native grasses, beginning with the second year of the entry, and that at least one-fourth of the area embraced in the entry has been continuously cultivated to agricultural crops other than native grasses, beginning with the third year of the entry and continuing to date of final proof.

Final proof submitted on an additional entry must show that the area of such entry required by the acts to be cultivated has been cultivated in accordance with such requirement; or that such part of the original entry as will, with the area cultivated in the additional entry, aggregate the required proportion of the combined entries, has been cultivated in the manner required by the acts.

Proof must be made on the original entry within the statutory period of seven years from the date of entry; and if it can not be shown at that time that the cultivation has been such as to satisfy the requirements of the acts as to both entries it will ne necessary to submit supplemental proof on the additional entry at the proper time. But proof should be made at the same time to cover both entries in all cases where the residence and cultivation are such as to meet the requirements of the acts.

Commutation of either original or additional entry, made under these acts, is expressly forbidden.

52. Right of Entry.—Homestead entries under the provisions of section 2289 of the Revised Statutes, for 160 acres or less, may be made by qualified persons within the States and Territories named upon lands subject to such entry, whether such lands have been designated under the provisions of these acts or not. But those who make entry under the provisions of these acts can not afterwards make homestead entry under

the provisions of the general homestead law, nor can an entryman who enters under the general homestead law lands designating as falling within the provisions of these acts afterwards enter any lands under these acts.

A person who has, since August 30, 1890, entered and acquired title to 320 acres of land under the agricultural land laws (which is construed to mean the timber and stone, desert land, and homestead laws), is not entitled to make entry under these acts; neither is a person who has acquired title to 160 acres under these acts, unless entitled to the benefits of section 2 of the act of June 5, 1900 (31 Stat., 267), or section 2 of the act of May 22, 1902 (32 Stat., 203, Appendix No. 5).

If, however, a person is a qualified entryman under the homestead laws of the United States, he may be allowed to enter 320 acres under these acts, or such a less amount as when added to the lands previously entered or held by him under the agricultural land laws shall not exceed in the aggregate 480 acres.

* * *

55. Officers Before Whom Applications and Proofs May Be Made.—The acts provide that any person applying to enter land under the provisions thereof shall make and subscribe before the proper officer an affidavit, etc. The term "proper officer," as used herein, is held to mean any officer authorized to take affidavits or proof in homestead cases.

FRED DENNETT, Commissioner.

Approved, September 24, 1910.

FRANK PIERCE, Acting Secretary.

The fees for making a homestead entry depend upon the quantity of land entered and whether it is within or outside the 40 mile limit of the grant to the Northern Pacific Railway Company.

For an enlarged homestead of 320 acres outside the limit of the railroad grant the fees are $22 and within the limit of the grant $34. For the homestead of 160 acres outside the limit of the railroad grant the fees are $16 and within the limits of the grant $22.

The person who desires to secure a fine tract of farming land in fertile Montana free under the homestead law is advised to read literature upon the various localities, which may be procured by sending his name to this office, and decide which seems best to him. He is advised to visit that locality and make personal invesitgation of the claims set forth for it. If a number of homeseekers desire to secure locations it is desirable that they select one of their number to visit the State and pick out locations, all sharing the expense of the trip.

Whether or not homeseekers should avail themselves of the services of land locators is purely a matter of choice; but if they do they are advised to inquire into the reliability of the man employed. The locators as a rule are trustworthy men engaged in a legitimate business who are ready to furnish satisfactory refernces as to their reliability and with whom it is safe to deal, but there were reports that last spring in a few instances homeseekers had been located on land already entered or of a

character different from that described by transient swindlers posing as locators. These men hurriedly fled the country and no one has earned the reward which the State of Montana offered for their capture; lest others may attempt a like swindle new comers are cautioned to deal with no one unable to furnish satisfactory references.

The State of Montana is fully organized in every department of government. It has a good public school system extending from the primary grades through the grammar and high schools to the higher institutions of learning, the State Normal School, the School of Mines, the Montana College of Agriculture and Mechanic Arts and the University of Montana.

The people are hospitable, energetic, law abidiing and prosperous.

Churches of the principal denominations are to be found in every county and are well supported.

It is a healthy country. The water is pure, the climate excellent and the soil uncommonly fertile.

In 1890 the population was 132,159; in 1900, 243,595; and in 1910 376,053.

The assessed valuation of all property was in 1900, $153,401,591; in 1909, $280,401,064 and in 1910, $309,673,699.

The total acres of land assessed in 1910 were 17,956,224 acres.

The State is divided into 29 counties as follows:

County.	County Seat.	Area Sq. Miles. (1)	Assessed Valuations.	Population 1900.	Population 1910.
Beaverhead	Dillon	4,597	$ 7,595,324	5,615	6,446
Broadwater	Townsend	1,182	3,205,616	2,641	3,491
Carbon	Red Lodge	2,411	7,191,148	7,533	13,962
Cascade	Great Falls	3,347	21,246,820	25,777	28,833
Chouteau	Fort Benton	15,539	15,736,639	10,966	17,191
Custer	Miles City	12,915	17,557,709	7,891	14,123
Dawson	Glendive	13,075	7,965,189	2,443	12,725
Deer Lodge	Anaconda	726	8,707,003	17,393	12,988
Fergus	Lewistown	8,892	16,887,276	6,937	17,385
Flathead	Kalispell	6,339	9,845,105	9,375	18,785
Gallatin	Bozeman	2,352	13,686,579	9,553	14,079
Granite	Philipsburg	1,617	3,174,597	4,328	2,942
Jefferson	Boulder	1,613	5,886,153	5,330	5,601
Lewis and Clark	Helena	3,415	20,908,650	19,171	21,853
Lincoln	Libby (2)	3,391	5,165,801	*	3,638
Madison	Virginia City	4,480	6,965,359	7,695	7,229
Meagher	White Sulphur Springs	3,508	7,108,566	2,526	4,190
Missoula	Missoula	4,182	16,799,987	13,964	23,596
Musselshell (3)	Roundup	*	*	*	*
Park	Livingston	2,651	8,861,320	7,341	10,731
Powell	Deer Lodge	2,514	5,671,990	*	5,904
Ravalli	Hamilton	2,396	5,532,111	7,822	11,666
Rosebud	Forsyth	9,510	9,987,091	*	7,985
Sanders	Thompson	2,803	4,406,985	*	3,713
Silver Bow	Butte	709	36,880,475	47,635	56,848
Sweet Grass	Big Timber	2,863	5,604,834	3,086	4,029
Teton	Choteau	7,466	8,324,483	5,080	9,546
Valley	Glasgow	13,264	8,583,424	4,355	13,630
Yellowstone	Billings	5,789	20,187,465	6,212	22,944
Totals		143,546	$309,673,699	243,329	376,053

* Organized since 1900.

(1) Figures furnished by the United States Surveyor General for Montana.

(2) Libby is the county seat of Lincoln County at present. At the election held Nov. 8, 1910, to determine the location of the county seat Eureka was selected, according to official election returns.

(3) Created from parts of Fergus, Rosebud and Yellowstone Counties by act of February 21, 1911.

According to the census of 1910 the population of the State of Montana was 376,053 of which number 114,676 were inhabitants of the nine principal cities, those having population in excess of 5,000. Populous suburbs are

not included in the returns from Butte and the returns for Great Falls were so unsatisfactory that a recount was demanded. The request was denied, and the citizens of that thriving and growing city have reason to believe that an injustice has been done them. Other towns increase the urban population to an extent that makes it equal to one-third, at least, of the total. These cities and towns and the mining and lumber camps furnish an unequalled market for Montana fruit and farm products. The local supply has failed to meet the local demand.

Population of cities above 5,000:

Butte	39,165
Great Falls	13,948
Missoula	12,869
Helena	12,515
Anaconda	10,134
Billings	10,031
Kalispell	5,549
Livingston	5,359
Bozeman	5,107

Montana is growing rapidly in population and wealth, the last three years particularly having witnessed a great development of the agricultural lands; but the movement is just begun and will gain momentum with every year until the vacant areas of rich farm lands are occupied. When Montana is settled the era of fertile farm lands to be secured as homesteads or purchased at the price of grazing lands will have passed in the United States. There is no other extensive area of fine farming land remaining untilled in any of the public land States.

The following table shows the number of acres in cultivation to principal crops in 1900 and 1910 and the value of the production for those years:

COMPARATIVE TABLE OF CROPS IN 1900 AND 1910.

Crop.	Acres.		Valuation.	
	1900.	1910.	1900.	1910.
Hay	369,161	600,000	$5,138,725	$10,500,000
Oats	65,865	350,000	1,078,869	6,118,000
Wheat	72,555	480,000	1,177,277	9,081,000
Barley	5,194	52,000	96,733	903,000
Rye	1,834	2,000	29,381	54,000
Potatoes	4,781	25,000	339,547	2,555,000
Corn	3,095	8,000	69,629	175,000
Flaxseed	.....	60,000	.....	1,008,000
Total	522,485	1,577,000	$7,930,161	$30,394,000

From 1900 to 1910 the average of the principal crops in cultivation increased 201%.

From 1900 to 1910 the value of the principal crops increased 283%.

From 1900 to 1910 the railroad mileage increased from 2,932 to 4,242 miles or 44%.

From 1900 to 1910 the population increased 54.5%.

From 1900 to 1910 the assessed valuations of property increased 101.8%.

Montana invites settlers and has put upon the Bureau of Agriculture, Labor and Industry the duties of a publicity bureau. Inquiries are sought from all who are looking for new homes. Where can they find better opportunities than in Montana? The fertile, untilled, farm lands beckon to the farmer to come and make his home and fortune upon them. Industrious and intelligent farmers are what Montana needs to bring about the development of its agricultural resources. The crop statistics that have been given show the rewards that come to the cultivators of the soil. Montana invites desirable settlers. It extends no invitation to the undesirable, the weakling or the drone; it seeks new citizens but is unwilling to sacrifice quality for quantity. Montana wants the home builder, not the land speculator. It wants farmers with means enough to buy producing farms or who can convert the raw lands into farms, equipping and maintaining them until they yield crops. In many instances a sum sufficient to pay for a farm well improved has been realized from the sale of the first two years' crops.

The man who owns a farm in Montana and has the true spirit of home-building enjoys an enviable lot. He dwells in a country where the ozone and the sunshine and the sense of roominess make mere living a joy. He sees his land growing constantly in value and his home becoming more attractive every year. The certainty of a steady income from the farm for the years that are to come is his; and he has, by his own efforts, won the right to hold himself erect before the world for he enjoys the fortune than which none can be greater, "the glorious privilege of being independent."

U. S. DEPARTMENT OF AGRICULTURE, WEATHER BUREAU.

Willis L. Moore, Chief.

Summary of the Climatological Data for the United States, by Sections.

By the Division of Meteorological Records, P. C. Day, in charge.

Section 26.—SOUTHEASTERN MONTANA.

The district embraces about 34,000 square miles of territory, being nearly equal in area to the state of Indiana. It includes the greater portion of the Yellowstone drainage basin, and portions of the Musselshell drainage in the northwest, and of the Little Missouri in the southeast. These streams and all of their principal tributaries have their sources in the high mountain regions of southern Montana and northern Wyoming. In their flood stages in the spring and early summer they carry a large volume of water that at present serves no useful purpose, but flows on to the Missouri River, serving only to swell the June freshet of the lower portion of that stream.

There are numerous extensive irrigation systems projected or in operation along the lower Yellowstone and some of its tributaries, but with one or two exceptions they utilize only the direct flow of the streams during the irrigation season, no steps having been taken as yet to store the vast surplus flow from April to June inclusive.

The greater portion of the district is a rolling or hilly plain, ranging in elevation from 3,000 to 4,000 feet. The southwest portion is more or less mountainous, being broken by the Beartooth and Pryor mountains, and the northern end of the Big Horn range.

This is, perhaps on the whole, the least developed portion of Montana, and has a population of little more than 20,000, or about one person to every one and a half square miles. By far the greater portion of the land is still in the primitive state, being used exclusively for grazing, and probably fifty per cent or more of the section is not adapted to other agricultural purposes.

A rapid transformation, especially in the northern portion, began in 1907, since which time much of the rich bench lands have been brought under cultivation under dry farming methods.

The soil and climate are well adapted to the raising of wheat, rye, oats, alfalfa, potatoes and many varieties of small fruits. In the western part of the district apple culture is making rapid development, especially in Yellowstone and Carbon counties, where, in favored localities, the raising of this variety of fruit has been highly successful.

The distinguished feature of the climate of this section as compared with other parts of the state is the wider range of temperature, both daily and annual. The summers are warmer than in either the northern or western portions, while the winter minimum falls nearly as low as in the northern, and considerably lower than in the western portion. There is a wide diurnal range of temperature during the summer months, resulting from the long days of this latitude, combined with the dry condition of the atmosphere, which is favorable for rapid heat radiation at night. In

July and August temperatures of 100 degrees or above are frequently recorded, but the night temperatures are usually 30 to 40 degrees lower. Temperatures of 40 degrees or more below zero are likely to occur during January or February, which are the coldest months, but these extreme temperatures are as a rule of short duration, and there are normally long periods throughout the winter with bright sunny weather and mild temperatures.

The precipitation is quite uniformly distributed over the section, outside of limited mountain districts, where the winter snows are much heavier than over the plains. The average annual amount at lower altitudes, is something over thirteen inches, about seven inches, or more than half of which, falls during the four months from April to July inclusive. Its seasonal distribution is therefore such as to best serve the needs of the agriculturist, since these are the principal growing months. During the harvesting season, from the middle of July to October, the precipitation is comparatively light, and it is a rare occurence that hay is damaged in the field, while the stacking or housing of grain before threshing is entirely dispensed with.

From January to March, and from October to December inclusive, practically all precipitation is in the form of snow, as is also a considerable part of that which falls in April, May and September. There are usually two or three snow storms during the winter that are accompanied by high winds, but the typical blizzard is rather a rare occurence in this section. The snow usually falls with temperatures much below freezing, and being light and dry, yields readily to the action of the high westerly winds that are apt to follow. As a rule therefore the bulk of the snow is blown into the gulches, leaving most of the country bare; a condition that is highly favorable for winter grazing.

R. F. YOUNG,
Section Director.

MONTHLY AND ANNUAL PRECIPITATION.
BILLINGS YELLOWSTONE COUNTY, MONTANA.
Elevation, 3,115 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1883	0.63	0.49	1.53	1.48	3.62	2.83	.....	.....	.....	.....	.....	.....	.....
1894	.....	.....	.....	1.96	1.95	3.81	0.43	0.50	1.27	1.26	1.05	0.60	.....
1895	1.95	0.35	0.74	2.10	0.55	3.08	0.51	1.51	0.22	2.20	1.20	0.22	14.63
1896	0.25	0.05	0.80	0.63	3.55	1.33	0.81	.....	.....	0.00	1.99	0.22	.....
1897	0.90	0.30	.....	.....	0.20	2.61	0.78	.....	0.40	1.03	2.44	0.45	.....
1898	0.22	0.30	2.20	0.02	5.73	4.59	1.41	1.07	0.55	.....	.....	0.10	.....
1899	0.96	T.	0.30	T.	3.50	.....	.....	.....	.....	.....	.....	.....	.....
1900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1902	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1903	.....	.....	0.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1905	0.92	0.30	.....	0.89	3.86	5.31	0.61	0.25	1.54	1.41	1.01	0.07	.....
1906	0.17	0.48	0.78	2.96	3.04	0.82	0.30	2.99	0.53	0.69	0.67	0.46	13.89
1907	1.25	1.25	1.44	1.21	4.63	1.17	1.63	.....	0.68	0.57	0.10	0.43	.....
1908	0.62	1.78	1.16	1.17	5.37	1.40	0.23	0.94	1.00	2.58	0.34	0.30	16.89
M'n.	0.79	0.53	1.06	1.24	3.27	2.70	0.74	1.21	0.78	1.22	1.10	0.32	14.96

EKALAKA, CUSTER COUNTY, MONTANA.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1897	0.46	0.34	1.10	0.57	1.25	1.00	0.58	0.36	.....	.....	.....	.....	.....
1898	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.23	0.47	.....
1899	0.30	0.32	.....	0.44	3.12	2.59	.....	.....	0.18	1.18	0.12	0.49	.....
1900	0.25	0.66	0.80	0.96	0.86	0.60	0.73	.....	1.87	0.04	0.39	.....	.....
1901	0.22	1.03	0.62	T.	.....	.....	.....	.....	1.64	.....	.....	.....	.....
1902	.....	.....	.....	0.85	3.42	1.41	1.89	1.79	.....	.....	.....	0.60	.....
1903	0.40	0.60	.....	.....	.....	.....	.....	.....	.....	0.20	.....	.....	.....
1904	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1905	.....	.....	1.08	1.38	1.40	3.33	3.30	0.41	1.60	0.95	0.23	0.30	.....
1906	0.33	.....	0.13	2.35	3.63	3.63	1.50	3.08	0.76	0.45	0.45	0.40	.....
1907	.....	0.65	0.26	0.43	3.54	3.21	2.86	1.74	1.42	0.08	T.	0.25	.....
1908	0.80	0.60	2.70	0.90	2.13	.....	0.51	2.18	2.03	2.51	0.20	0.20	.....
M'n.	0.47	0.60	0.96	0.76	2.42	2.25	1.62	1.59	1.36	0.77	0.22	0.39	13.41

FORSYTH, ROSEBUD COUNTY, MONTANA.
Elevation, 2,514 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1904	.....	.....	.....	.....	.....	.....	.....	0.28	0.74	T.	0.10	0.50	.....
1905	0.60	0.30	0.04	0.41	1.83	3.49	2.38	T.	1.39	1.11	1.10	0.10	12.75
1906	0.20	1.00	1.24	0.72	4.69	2.94	0.35	1.45	1.21	0.36	1.12	0.70	15.98
1907	1.70	0.84	0.75	0.65	4.71	3.53	.....	.....	.....	.....	.....	0.28	.....
1908	0.46	0.30	0.90	1.32	.....	.....	.....	.....	.....	.....	T.	0.30	.....
M'n.	0.74	0.61	0.73	0.78	3.74	3.32	1.36	0.58	1.11	0.49	0.58	0.38	14.42

MILES CITY—FORT KEOGH—CUSTER COUNTY, MONTANA.
Elevation, 2,371 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1877	.....	.....	.....	.....	.....	.....	.....	0.00	0.70	0.61	0.46	0.00	.....
1878	T.	0.15	2.09	3.26	4.00	1.14	1.29	0.29	1.51	1.05	0.18	0.25	15.21
1879	0.26	0.69	0.28	2.20	2.75	5.23	5.90	1.84	0.44	2.47	0.11	0.58	22.75
1880	0.32	0.17	0.51	0.48	3.51	3.05	2.66	2.00	0.07	0.19	0.56	1.12	14.64
1881	2.35	0.36	0.31	0.35	0.76	4.44	0.39	0.93	0.55	0.46	0.44	0.10	11.44
1882	0.18	0.18	0.41	2.06	2.57	1.76	0.58	0.00	1.21	0.62	0.19	0.37	10.13
1883	0.18	0.11	0.39	1.37	2.80	1.27	0.66	1.25	0.00	0.84	0.20	0.00	9.07
1884	T.	0.37	0.30	1.20	0.00	2.78	2.62	1.76	0.46	0.14	0.26	0.24	10.13
1885	1.06	0.00	0.36	1.28	0.44	3.24	1.86	0.32	0.44	0.00	1.06	0.22	10.24
1886	0.50	0.50	0.68	0.26	5.82	2.28	0.34	0.52	0.34	1.36	0.40	0.34	13.14
1887	1.20	0.26	0.16	1.08	1.22	1.82	0.44	2.30	1.74	1.14	0.16	0.31	11.83
1888	1.04	1.43	0.31	0.15	1.35	4.29	1.02	2.60	T.	0.27	0.23	0.30	12.99
1889	0.46	1.68	1.01	0.20	2.62	0.18	0.37	1.26	1.06	0.67	0.35	0.08	9.94
1890	0.28	0.40	0.69	0.11	0.82	5.40	0.05	0.03	2.12	0.75	0.37	0.50	11.52
1891	0.12	1.03	0.35	1.16	1.59	5.45	1.15	0.10	0.70	1.26	0.46	0.10	13.47
1892	0.39	0.34	0.26	1.39	1.43	3.16	1.15	0.60	0.52	0.98	0.70	0.56	11.48
1893	0.57	0.44	0.47	1.45	4.07	1.67	1.25	0.05	1.89	1.25	0.50	0.55	14.16
1894	0.73	0.07	4.03	1.44	3.53	2.14	0.27	0.40	0.72	1.86	0.45	0.23	15.86
1895	0.80	0.64	0.24	1.31	1.59	4.40	0.64	0.39	0.30	0.89	0.77	0.77	12.74
1896	0.53	0.51	0.28	1.26	2.92	1.86	1.29	0.33	0.66	0.62	1.37	0.09	11.72
1897	0.69	0.65	3.50	1.69	0.35	1.23	0.59	0.32	0.12	0.44	1.18	0.26	11.02
1898	0.17	0.35	1.54	0.77	2.61	1.99	1.01	0.12	0.89	1.77	0.92	0.31	12.45
1899	0.55	0.36	1.85	2.09	2.84	2.44	1.88	1.39	0.04	1.06	0.39	0.35	15.24
1900	0.13	0.39	0.77	0.96	0.20	0.35	0.58	4.58	2.00	0.10	0.39	0.10	10.55
1901	0.12	0.44	0.60	0.56	1.40	3.94	3.54	0.76	1.39	0.08	0.42	0.65	13.90
1902	0.05	0.31	1.15	0.67	2.86	2.21	1.12	1.34	0.47	0.10	0.10	0.22	10.60
1903	0.19	0.51	0.28	0.56	1.07	0.94	2.70	1.43	1.58	0.32	0.26	0.14	9.98
1904	0.44	0.30	2.46	0.06	1.96	2.28	0.74	0.44	0.22	0.00	0.10	0.14	9.14
1905	0.28	0.14	0.04	0.24	1.78	3.59	3.37	0.05	1.45	0.86	0.50	0.09	12.42
1906	0.19	0.57	0.58	1.60	3.84	4.02	0.43	2.04	0.81	0.30	0.84	1.39	16.61
1907	1.28	0.34	0.84	0.61	4.39	3.98	1.55	1.02	0.16	0.22	0.04	0.32	14.75
1908	0.63	0.66	1.81	0.91	5.58	2.92	1.97	0.63	1.42	2.31	0.07	0.25	19.16
M'n.	0.47	0.46	0.92	1.06	2.34	2.76	1.40	0.96	0.81	0.78	0.45	0.34	12.75

RED LODGE, CARBON COUNTY, MONTANA.
Elevation, 5,548 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	3.48	.....	0.46	3.45	1.31	0.12	1.16	0.46	.....	.....	.....
1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1896	0.65	0.35	3.90	.....	.....	4.12	.....	.....	.....	.....	.....	.....	.....
1897	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1898	.....	1.52	2.62	2.52	12.63	4.17	.....	.....	.....	.....	0.30	0.97	.....
1899	2.85	1.00	2.30	0.50	1.10	.....	.....	.....	.....	0.40	T.	0.70	.....
1900	1.90	1.50	1.62	7.90	1.60	0.00	0.00	0.00	.....	.....	.....	0.90	.....
1901	.....	.....	.....	.....	.....	.....	.....	0.69	1.76	.....	.....	.....	.....
1902	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.50	.....
1903	0.44	1.61	0.43	2.96	2.04	2.06	1.81	0.60	2.41	0.71	0.87	0.81	16.75
1904	0.71	1.57	2.15	2.43	4.29	1.12	0.66	1.18	0.87	0.07	0.12	0.36	15.53
1905	0.41	0.11	2.05	2.76	8.29	4.86	0.79	0.99	1.15	2.97	0.82	0.06	25.26
1906	0.31	0.56	2.06	1.72	4.72	1.87	1.70	2.83	1.24	1.44	0.24	0.21	18.90
1907	0.49	0.80	1.09	2.06	4.28	3.31	2.55	1.35	2.94	1.13	0.73	0.29	21.02
1908	0.74	1.26	1.08	1 62	11.90	2.57	1.06	1.34	1.11	2.30	0.32	1.20	26.50
M'n.	0.94	1.03	2.07	2.72	5.13	2.75	1.24	1.01	1.58	1.18	0.42	0.60	20.67

MEAN TEMPERATURE.

Stations.	Length of Record.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Billings	16	24.6	25.9	33.8	45.3	55.7	62.1	71.7	70.4	60.5	50.8	33.2	29.5	47.2
Busby	6	24.3	21.0	32.9	45.6	50.8	60.3	68.2	68.0	60.1	47.9	33.8	24.8	44.8
Crow Agency	30	18.6	20.1	32.4	46.6	55.6	63.6	70.9	69.5	58.6	47.6	33.3	25.0	45.2
Decker	4	17.6	21.4	32.4	42.2	50.1	60.4	71.6	65.2	58.2	47.1	31.5	23.8	43.5
Ekalaka	9	20.3	16.9	29.2	43.5	53.0	61.9	68.9	67.9	59.8	47.3	32.7	23.4	43.7
Fallon	4	11.8	16.9	30.4	44.6	50.9	62.2	70.0	68.0	61.2	45.2	42.4	25.1	44.1
Forsyth	4	17.5	22.1	34.5	47.2	52.0	62.0	70.8	70.2	62.0	47.0	36.2	25.2	45.6
Huntley	3	21.1	28.2	36.2	46.3	52.9	61.3	70.9	68.0	60.3	49.2	37.9	28.8	46.8
Lodgegrass	4	21.7	21.4	33.6	46.5	53.4	59.5	67.5	65.5	58.6	45.8	34.8	26.0	44.5
Miles City	31	15.1	16.4	30.3	47.0	56.5	66.3	72.6	71.5	59.8	47.3	31.8	21.2	44.6
Red Lodge	10	23.2	22.0	26.6	39.6	46.0	55.6	61.2	60.6	52.4	42.9	33.0	25.9	40 8
Wibaux	9	16.3	17.8	27.0	46.3	56.2	61.7	69.7	66.8	56.8	45.8	27.2	23.2	42.9

AVERAGE SNOWFALL.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Billings	7.7	7.5	11.7	4.7	1.4	T.	0.0	0.0	T.	1.5	4.6	3.9	43.0
Busby	9.2	6.5	9.2	4.9	4.0	0.0	0.0	0.0	0.2	5.8	2.2	8.5	50.5
Crow Agency	6.8	7.0	11.1	4.6	0.7	0.0	0.0	0.0	0.3	2.4	5.3	5.7	43.9
Decker	3.7	2.7	3.5	2.5	7.0	0.0	0.0	0.0	0.2	0.4	1.0	2.0	23.0
Ekalaka	5.1	6.1	8.2	2.4	0.6	0.0	0.0	0.0	0.3	1.8	1.3	3.9	29.7
Fallon	1.9	0.8	1.2	1.0	7.6	1.0	0.0	0.0	0.0	0.0	0.2	3.6	17.3
Forsyth	7.5	3.0	7.0	2.5	0.3	0.0	0.0	0.0	0.0	0.7	4.8	4.4	30 2
Huntley	3.0	7.8	5.6	1.4	T.	0.0	0.0	0.0	T.	0.5	1.0	1.8	21.1
Lodgegrass	10.9	1.6	3.1	3.7	0.0	T.	0.0	0.0	0.0	0.8	3.8	4.5	28.4
Miles City	4.4	3.6	8.0	1.3	1.9	0.0	0.0	0.0	0.2	1.1	3.9	2.8	27.2
Red Lodge	11.9	14.6	20.9	18.2	17.2	0.9	0.0	0.0	5.3	7.9	6.6	8.6	112.1
Wibaux	3.8	2.6	17.8	T.	T.	T.	0.0	0.0	0.0	T.	1.5	4.9	30.6

AVERAGE NUMBER OF DAYS WITH .01 INCH OR MORE OF PRECIPITATION.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Billings	6	3	6	4	12	10	4	3	3	4	4	4	63
Busby	6	3	6	2	8	8	4	4	4	4	2	5	56
Crow Agency	6	6	7	7	10	10	5	4	5	5	4	5	74
Decker	2	2	3	2	5	6	2	2	2	2	1	1	30
Ekalaka	4	5	4	4	8	9	7	8	5	4	3	4	65
Fallon	2	1	1	2	5	6	3	4	2	1	1	1	29
Forsyth	4	2	4	4	10	7	4	3	3	2	4	3	50
Huntley	2	4	8	4	14	13	5	5	4	4	2	3	68
Lodgegrass	5	2	4	4	9	8	2	4	3	2	3	2	48
Miles City	8	7	9	7	10	11	8	6	4	6	6	6	88
Red Lodge	5	4	8	7	12	11	5	6	5	4	3	4	74
Wibaux	2	2	4	2	6	10	4	4	1	1	1	3	40

PREVAILING WIND DIRECTION.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Billings	w.	w.	w.	w.	w.	w.	w.	w.	e.	w.	w.	w.	w.
Busby	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Crow Agency	s.	n.	se.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	w.	nw.
Ekalaka	nw.	sw.	nw.	nw.	e.	nw.	w.	w.	w.	nw.	nw.	nw.	nw.
Fallon	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Forsyth	e.	w.	e.	e.	e.	w.	w.	e.	e.	w.	w.	nw.	e.
Huntley	w.	w.	w.	w.	nw.	w.	w.	w.	w.	w.	w.	w.	w.
Lodgegrass	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Miles City	s.	s.	n.	nw.	ne.	w.	nw.	ne.	nw.	nw.	s.	s.	nw.
Red Lodge	se.	se.	se.	nw.	nw.	se.	se.	se.	se.	se.	se.	se.	se.
Wibaux	w.	nw.	nw.	nw.	se.	nw.	w.	nw.	w.	nw.	nw.	w.	nw.

FROST DATA.

Stations.	Length of Record, Years.	Average Date of First Killing Frost in Autumn.	Average Date of Last Killing Frost in Spring.	Earliest Date of Killing Frost in Autumn.	Latest Date of Killing Frost in Spring.
Billings	10	September 16	May 7	August 28	June 23
Busby	6	September 17	June 3	September 10	June 29
Crow Agency	27	September 26	May 15	September 7	June 21
Decker	5	September 7	May 23	August 25	May 28
Ekalaka	7	September 22	May 22	September 3	May 2
Fallon	4	September 29	May 22	September 14	May 28
Forsyth	3	September 29	May 9	September 14	May 14
Huntley	3	September 29	May 5	September 26	May 8
Lodgegrass	4	September 21	May 18	September 13	May 27
Miles City	18	September 24	May 7	September 7	May 22
Red Lodge	8	September 2	June 13	August 6	June 28
Wibaux	4	September 13	May 14	September 7	May 14

Hydrographic Data for Section 26, Summary of Climatological Data for the United States.

Compiled from the Records of the United Sttates Geological Survey by R. H. Bolster, Assistant Engineer.

Preliminary Note:—Only the broader facts concerning the rivers are here given. Information in more detail can be procured on application to the Director, United States Geological Survey, Washington, D. C.

This section lying in the southeasterly quarter of the State of Montana comprises the main portion of Yellowstone River, with portions of its tributaries—Big Horn and Powder rivers.

Yellowstone River has its source in the lake of the same name situated in Yellowstone National Park. It flows in a northward course into Montana, through which it continues to its junction with Missouri River near the North Dakota line. Yellowstone Valley contains the largest body of irrigable land in the State; its altitude is about 2500 feet.

In this section are located two important projects of the United States Reclamation Service, as follows:

The Huntley Irrigation Project was completed in 1907, and draws water from Yellowstone River for the irrigation of 33,000 acres of land. The principal crops are alfalfa (three crops), other forage crops, hardy vegetables, and fruits. The value of the irrigated land is $75 per acre.

The Crow Reservation Irrigation Project is located in the Crow Indian Reservation. The principal streams running through the reservation are Big Horn and Little Big Horn rivers and Pryor Creek, all of which flow in a northerly direction and are tributary to Yellowstone River. A number of canals constructed by the Office of Indian Affairs are now in operation, covering an area of about 50,000 acres. Big Horn River discharges approximately 3,000,000 acre-feet of water per annum.

The following table shows in a general way the stream flow which can be expected to prevail for a given month of an average year. Opposite each amount is given: First, the maximum flow for a 24-hour period which has been observed during the period covered by the table; second, the minimum flow for a 24-hour period which has been observed during the period covered by the table; third, the mean flow for that month during the entire period covered by the table. The two remaining columns are computed from the third column of mean monthly discharge. Column 4 gives the mean flow for the entire period in cubic feet per second per square mile on the assumption of a uniform rate of discharge from each square mile of the drainage area. Column 5 gives the depth in inches to which the entire drainage area would be covered in an average month, if all the water flowing from it during the month were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

MONTHLY DISCHARGE OF YELLOWSTONE RIVER NEAR GLENDIVE, MONTANA, FOR PERIOD 1903-1905.

(Drainage area 66,090 square miles.)

MONTH.	Discharge in Second-Feet.				Depth in Inches on Drainage Area.
	Maximum.	Minimum.	Mean.	Per Square Mile.	
January	.....	.....	5700	.086	.10
February	.....	.....	5700	.086	.09
March	.....	.....	5700	.086	.10
April	48000	3750	8170	.124	.14
May	66200	4700	12500	.189	.22
June	77900	10600	47800	.723	.81
July	61000	16400	30300	.458	.53
August	30200	6470	12600	.191	.22
September	14700	4310	7250	.110	.12
October	8160	5200	6300	.095	.11
November	5900	5100	5020	.076	.08
December	.....	.....	3850	.058	.07
The Period	77900	3750	12600	.190	2.59

Section 27.—SOUTHWESTERN MONTANA.

This section embraces the southwestern portion of Montana, and contains approximately 30,000 square miles, being nearly equal in area to the State of South Carolina. The population in 1900 was about 50,000, but at the present time, (1909) is more than three times that number.

Practically the entire area is what may be termed mountainous, and within its boundaries are most of the principal mountain ranges of the State east of the main range of the Rockies. The western boundary is formed by the Continental Divide, and the most important ranges, most of which trend from north to south, are the Boulder, Ruby, Snowcrest, and Tobacco Root, forming the watershed between the Jefferson and Madison rivers, the Madison range separating the Madison and Gallatin basins, and the Gallatin and Bridger ranges which divide the waters of the Gallatin and Yellowstone. The northern half of the section is traversed by the Big Belt and Little Belt ranges, and includes various groups, the most important of which are the Castle, Crazy, Big Snowy and Little Snowy mountains.

The three streams that combine to form the Missouri, namely the Jefferson, Madison, and Gallatin, are almost wholly within this section, and drain approximately half of the area. The eastern portion is in the upper drainage basins of the Yellowstone and Musselshell rivers. These rivers are fed by countless mountain torrents, creeks and rivers, which form a most complex drainage system, and make this one of the most bountifully watered portions of the semi-arid west.

The valleys are for the most part comparatively narrow but on the whole contain an extensive area of rich agricultural land. The ascent from the valleys is gradual, and bordering them are large areas of rich and comparatively level table or bench lands, that are rapidly being brought into cultivation under a dry farming system. On the foothills and moun-

tain slopes a luxuriant growth of bunch grass and blue joint affords unsurpassed natural pasturage for cattle, sheep and horses.

Only a small part of the water flow of the streams is as yet utilized for irrigation, and no large irrigation projects have been undertaken owing to the fact that irrigable areas are somewhat limited, and most of the valleys are readily watered from the direct flow of the streams.

The possibilities of water power development are almost limitless, and some important engineering projects along this line have been completed, while several large power plants are in course of constructino. For the most part the the power so far developed is applied to mining, street railway transportation and lighting.

Butte and Anaconda are in the center of one of the richest mining districts in the world, and various minerals abound throughout the section.

The meterological records, especially those of temperature and winds, reveal a rather greater uniformity in climatic conditions than might be expected in a region so broken and mountainous. This is in a large measure due to the fact that most stations have been located in the valleys, and the records typify only the climate between 4,000 and 5,000 feet altitude. However the temperatures of two stations or high altitude will illustrate the variety of climate that may exist under the influence of mountain ranges. Butte and Bowen are at almost the same altitude. The former is cooler in summer and warmer in winter than most places of lower elevations, while Bowen is colder throughout the year than other stations, the difference being almost marked in the winter months.

The annual range of temperature here is less than in the section immediately to the eastward, the summers on the whole being pleasantly cool, while the winter cold is less intense, and its effect is modified by the rare atmosphere due to high altitudes, the low humidity, and the absence of high winds.

The precipitation is somewhat irregularly distributed, even considering localities of nearly equal elevations, and generally speaking the annual amount increases with elevation. The driest section is the lower portion of the Jefferson drainage basin, and the mountain enclosed basin along the Missouri, immediately below the confluence of the former with the Madison and Gallatin, the annual amounts over these districts being scarcely ten inches.

As a rule the precipitation is lightest in the autumn and winter, and the wettest season is from April to June inclusive. Nearly all precipitation from October to April is in the form of snow, although, with rare exceptions, the ground does not remain covered in the valleys for extended periods, even during the winter months.

Thunderstorms are of frequent occurence during the summer months, but they are rarely accompanied by heavy rainfall. Damaging hail storms over limited areas occur occasionally, and some destructive floods in May and June have been caused by the heavy rains of those months, combined with the melting snows in the mountains.

In the high mountain ranges the snow accumulates to great depths, especially where protected by great forests, and where the free action of the winds serves to carry a large percentage of the fall from ridges into the deep ravines and gulches. In these higher regions most of the streams have their sources, and notwithstanding that the area of perpetual snow is very limited, the flow of water in most of them is continuous, and comparatively uniform throughout the year. In the drainage basins of many small streams practically no snow remains after the middle or last of June, and yet the volume of water carried by them shows no marked diminution throughout the summer and autumn. In such cases the source of supply is evidently the ground water from the snows and rains of the previous winter and spring.

Below an elevation of 6,000 feet the annual snowfall varies from about 25 to 120 inches.

The prevailing wind direction over most of the section is southwest, and the average hourly velocity at Helena, the only station having a record, is seven miles per hour.

R. F. YOUNG, Section Director.

MONTHLY AND ANNUAL PRECIPITATION.

AGRICULTURAL COLLEGE, AT BOZEMAN, GALLATIN COUNTY, MONTANA.

Elevation, 4,700 feet.

Combined with Fort Ellis, 1868 to 1886, Elevation 4878 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1868	.....	.....	.....	.....	.....	.....	.....	0.88	2.12	0.32	0.91	2.86	.....
1869	1.15	1.25	2.90	3.13	5.91	2.65	0.85	T.	0.54	0.40	0.13	0.63	19.54
1870	0.06	0.11	0.65	0.54	0.18	0.61	0.00	.....	.....	.....	.....	.....	.....
1871	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1872	.....	.....	.....	.....	.....	.....	.....	1.04	2.61	0.23	0.51	1.09	.....
1873	0.38	0.30	1.02	0.80	1.86	5.90	.....	1.21	0.58	0.93	0.51	0.86	.....
1874	0.37	0.78	1.53	0.54	6.16	2.58	0.49	2.73	1.58	1.04	0.90	1.04	19.74
1875	0.80	1.13	0.85	0.56	5.60	2.90	1.56	3.22	0.66	0.87	1.07	0.19	19.41
1876	0.07	0.27	1.13	0.99	7.10	2.38	0.21	2.32	0.54	0.84	1.66	1.07	18.58
1877	0.48	0.77	0.76	1.11	4.02	2.39	0.77	0.40	1.41	1.50	0.80	1.25	15.56
1878	0.90	0.91	1.01	1.40	6.03	3.34	0.63	0.87	2.78	1.83	0.08	1.72	21.50
1879	1.20	1.42	2.77	2.06	1.89	3.63	0.48	0.53	0.38	1.64	0.30	4.78	21.08
1880	0.87	1.82	2.20	4.24	7.13	8.01	1.16	0.34	0.28	2.05	1.32	0.74	30.16
1881	2.53	0.83	1.17	2.25	1.44	1.74	1.24	0.84	1.12	1.89	2.43	0.07	17.55
1882	1.03	1.01	2.50	2.62	2.94	3.03	1.16	0.33	2.21	1.30	0.69	0.86	19.68
1883	1.30	0.68	0.71	1.76	2.04	2.45	0.41	2.01	1.05	2.07	0.88	1.12	16.48
1884	1.25	0.75	0.82	1.31	2.98	3.50	2.48	1.10	4.65	1.38	0.00	1.80	22.02
1885	0.63	1.40	0.54	1.04	12.26	7.35	3.61	1.25	1.20	1.50	1.10	0.75	32.63
1886	0.88	1.16	1.68	3.78	1.45	2.83	1.18	1.01	.....	.....	.....	.....	.....
1893	0.39	0.37	0.60	0.86	3.16	.....	.....	.....	.....	.....	.....	.....	.....
1894	.....	.....	.....	3.07	2.54	4.73	2.16	0.53	2.18	1.15	0.00	0.60	.....
1895	1.33	0.27	1.10	1.18	2.36	3.27	0.97	0.57	2.95	0.44	2.22	1.50	18.16
1896	0.50	0.21	0.87	1.44	2.35	2.65	0.92	0.37	2.91	0.58	2.28	0.39	15.47
1897	1.51	0.70	0.73	1.44	0.78	3.95	2.09	0.26	1.12	2.71	1.52	0.61	17.42
1898	0.60	0.49	1.62	1.07	4.60	3.18	0.84	0.47	0.93	.....	.....	.....	.....
1899	0.42	2.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900	0.11	1.60	0.89	3.24	2.51	0.39	1.32	0.68	1.24	1.63	0.05	0.52	14.18
1901	.....	0.55	1.21	1.29	5.01	1.56	.....	.....	.....	.....	0.73	1.46	.....
1902	0.41	0.66	0.77	1.21	3.90	2.60	0.87	1.13	2.07	T.	1.11	0.73	15.46
1903	0.78	0.33	0.67	3.42	2.58	2.45	2.76	0.50	1.11	0.64	1.62	0.78	17.64
1904	0.85	2.25	2.98	1.36	2.02	1.74	1.11	0.86	0.06	0.56	0.37	2.03	16.19
1905	0.23	0.75	0.77	0.80	3.23	2.62	1.30	1.21	1.48	1.18	0.78	0.38	14.73
1906	0.74	0.75	0.92	1.61	2.34	3.39	0.47	1.80	1.38	1.35	1.70	0.43	16.88
1907	0.93	0.80	1.86	0.59	3.16	3.79	2.46	1.37	0.41	1.08	0.36	0.42	17.23
1908	0.52	1.27	1.40	1.36	9.54	4.57	0.32	1.09	1.72	1.97	0.35	0.36	24.47
M'n.	0.77	0.91	1.29	1.68	3.84	3.21	1.21	1.03	1.49	1.18	0.91	1.08	18.60

BIG TIMBER, SWEETGRASS COUNTY, MONTANA.
Elevation, 4,072 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	.....	1.49	3.73	.....	.....	.....	.....	.....	.....	.....	.....
1895	.....	.....	.....	.....	.....	4.69	0.50	1.38	1.14	0.28	1.34	0.36	.....
1896	0.31	0.43	2.13	1.73	3.93	1.50	1.34	0.43	2.81	0.79	1.96	0.08	17.44
1897	1.00	0.10	0.25	0.44	1.05	.....	0.93	.....	.....	.....	1.88	0.41	.....
1898	0.35	T.	1.71	0.90	.....	.....	.....	.....	.....	.....	.....	.....	.....
1899	1.68	0.22	0.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	0.01	0.26	0.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1902	0.05	0.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
M'n.	0.57	0.29	1.02	1.14	2.90	3.10	0.92	0.90	1.88	0.54	1.73	0.28	15.27

BOULDER, JEFFERSON COUNTY, MONTANA.
Elevation, 4,920 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	.....	.....	.....	.....	.....	.....	.....	.....	0.56	0.07	0.27	0.13	.....
1892	0.34	0.02	0.08	1.13	0.62	4.33	1.10	0.22	.....	.....	0.69	0.19	.....
1893	1.53	0.20	0.08	1.31	1.16	1.24	0.38	0.35	1.76	0.57	0.54	0.45	9.57
1894	0.77	0.14	0.71	0.74	1.06	2.59	0.90	0.70	1.99	0.50	0.14	0.19	10.43
1895	0.49	0.17	0.03	0.38	0.73	2.90	0.74	0.06	0.81	0.46	.....	.....	.....
1896	.....	.....	.....	.....	.....	.....	.....	2.50	.....	0.30	.....	T.	.....
1897	.....	.....	.....	.....	1.12	2.38	1.31	.....	.....	.....	.....	.....	.....
1898	.....	.....	.....	.....	3.75	1.83	0.54	0.38	.....	.....	0.09	0.05	.....
1899	1.65	0.50	0.70	1.50	1.60	1.02	0.80	1.71	0.62	0.90	0.05	1.05	12.10
1900	0.53	0.75	0.58	1.59	1.88	0.19	0.97	0.54	1.17	1.57	0.10	0.37	10.24
1901	0.58	0.70	0.21	1.95	2.14	1.81	0.38	0.35	1.36	0.14	0.18	1.17	10.97
1902	0.05	0.51	0.39	0.61	2.38	0.70	1.99	0.60	0.41	0.40	1.25	1.05	10.54
1903	0.45	0.37	0.98	0.83	1.70	0.85	1.91	0.30	0.91	0.39	0.45	0.34	9.48
1904	0.46	1.09	0.61	0.13	1.11	0.89	0.77	0.70	00.0	0.09	0.17	0.21	6.23
1905	0.31	0.16	0.77	0.77	1.11	3.84	2.04	0.88	T.	T.	0.20	T.	10.08
1906	0.25	0.40	0.83	0.08	2.90	1.96	0.32	1.95	0.30	T.	0.75	0.75	10.49
1907	1.00	0.52	.....	0.11	.....	2.65	.....	.....	.....	.....	.....	.....	.....
1908	.....	.....	.....	.....	.....	.....	1.08	0.23	2.13	.....	.....	.....	.....
M'n.	0.65	0.43	0.50	0.86	1.66	1.95	1.02	0.76	0.92	0.41	0.38	0.46	10.00

BUTTE, SILVER BOW COUNTY, MONTANA.
Elevation, 5,716 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	.....	0.93	1.00	1.78	1.86	0.87	1.41	0.64	0.14	0.22	.....
1895	0.93	0.14	0.27	0.25	1.09	0.85	1.07	0.19	1.19	0.17	0.31	0.49	6.95
1896	0.30	0.37	0.32	0.55	1.43	1.07	1.19	0.87	1.95	0.47	1.62	0.37	10.51
1897	1.20	0.70	1.04	1.63	1.44	3.02	1.19	0.30	0.98	1.10	1.52	1.12	15.24
1898	0.57	0.55	1.56	0.51	.....	3.06	0.54	0.45	0.91	.....	.....	.....	.....
1899	2.35	1.39	1.21	1.57	2.46	0.55	0.90	2.35	0.55	1.65	0.14	1.10	16.22
1900	0.30	1.05	1.20	2.75	2.90	0.66	1.13	0.48	1.40	2.08	0.20	0.40	14.55
1901	0.60	0.65	1.65	2.35	3.40	2.00	0.55	0.30	0.90	0.45	T.	1.70	14.55
1902	T.	1.00	0.75	1.35	3.20	0.75	1.15	0.25	0.10	0.20	0.65	0.90	10.50
1903	0.42	0.05	1.30	1.30	1.20	0.80	0.65	0.60	0.50	0.70	1.90	0.85	10.27
1904	1.40	2.92	2.05	0.30	1.02	1.00	2.00	0.35	0.00	0.05	0.12	1.35	12.56
1905	0.70	0.10	1.15	0.85	2.05	3.15	1.80	1.00	0.45	0.65	0.35	0.15	12.40
1906	1.10	1.70	0.90	1.70	3.64	1.95	0.20	2.20	0.50	0.10	0.80	0.95	15.74
1907	0.80	1.00	0.55	1.30	1.25	2.87	2.82	2.20	1.50	0.20	0.10	0.24	14.83
1908	0.50	0.75	0.90	0.40	5.67	4.22	0.70	0.75	2.45	1.30	0.20	0.15	17.99
M'n.	0.80	0.88	1.06	1.18	2.27	1.85	1.18	0.88	0.99	0.70	0.58	0.71	13.08

DILLON, BEAVERHEAD COUNTY, MONTANA.

Elevation, 5,147 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	0.94	0.61	1.58	1.22	4.54	1.37	0.83	0.68	1.38	1.13	1.06	0.94	*16.28
1899	1.08	0.47	1.52	0.65	2.00	2.12	0.24	1.24	1.19	1.31	1.03	1.38	*14.22
1900	0.01	0.31	1.23	2.27	1.56	0.73	0.61	1.32	1.34	2.84	1.15	0.17	13.54
1901	0.12	0.73	0.96	3.26	2.48	2.85	0.24	1.00	4.77	0.43	0.46	2.49	19.79
1902	0.99	0.45	0.96	4.95	2.47	1.74	1.18	1.26	0.24	0.16	1.21	0.55	16.17
1903	0.82	0.07	1.23	5.36	2.12	1.64	2.49	1.16	1.45	0.23	1.52	1.01	19.10
1904	0.64	2.14	1.38	0.98	2.54	1.91	0.05	1.18	0.07	0.31	0.02	0.20	11.51
1905	0.60	0.14	2.23	3.00	3.17	3.96	1.36	2.77	0.26	0.39	0.69	0.09	18.66
1906	1.01	0.25	1.38	0.77	4.11	2.62	0.42	3.17	0.88	0.21	1.16	1.27	17.25
1907	1.65	1.43	1.64	1.39	3.03	5.67	2.85	2.00	1.01	0.71	0.29	0.31	21.98
1908	0.92	0.43	1.59	0.34	9.16	3.54	0.47	0.68	1.00	2.00	0.14	0.34	20.61
M'n.	0.30	0.64	1.43	2.20	3.38	2.56	0.98	1.50	1.24	0.88	0.79	0.80	17.20

*Years 1898 and 1899 from old records furnished by observer at Dillon.

FORT LOGAN, MEAGHER COUNTY, MONTANA.

Elevation, 6,000 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1870	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.50	0.40	.....	.....
1871	1.50	1.70	1.00	0.90	.....	.....	.....	.....	.....	.....	2.30	.....	.....
1872	.....	0.80	1.70	0.35	.....	.....	.....	.....	.....	.....	.....	0.40	.....
1873	0.84	1.22	0.32	1.20	2.04	1.10	0.88	0.42	0.20	1.10	1.36	0.06	10.74
1874	0.30	.....	0.44	0.00	2.06	1.52	0.10	2.26	1.04	0.38	3.82	0.12	.....
1875	0.51	.....	.....	.....	.....	1.06	2.42	3.53	0.50	0.25	0.83	0.05	.....
1876	0.30	0.24	0.53	0.50	7.14	0.86	1.78	3.50	1.00	0.60	0.18	0.51	17.14
1877	0.60	0.10	2.95	2.27	3.68	1.20	3.18	0.43	1.02	1.15	0.20	0.05	16.83
1878	0.25	0.45	1.25	2.85	4.33	5.43	2.50	0.62	0.77	0.35	0.50	0.10	19.40
1879	1.00	1.25	1.86	1.19	3.55	1.20	0.25	T.	1.03	1.00	0.00	1.25	13.58
1880	0.15	0.05	0.45	1.45	2.58	0.49	0.93	0.82	0.60	0.69	1.14	0.32	9.67
1889	.....	.....	.....	.....	2.03	0.82	0.62	0.31	0.81	0.37	0.15	0.37	.....
1890	0.90	0.60	0.40	0.70	1.90	2.80	0.25	0.15	0.85	0.33	.....	.....	.....
1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1892	.....	0.20	1.00	.....	0.38	4.44	2.59	.....	0.37	0.51	0.51	0.99	.....
1893	0.96	0.15	0.21	1.64	1.63	2.23	.....	.....	2.18	.....	1.05	0.37	.....
1894	1.30	0.20	1.26	1.55	2.04	3.93	0.51	0.30	1.28	0.98	0.65	0.30	14.30
1895	0.32	0.21	0.37	1.99	0.97	1.23	1.08	0.22	1.96	0.55	0.46	0.47	9.83
1896	.....	0.02	0.19	0.96	1.48	9.62	2.90	.....	.....	0.44	2.71	.....	.....
1897	0.62	0.62	0.74	0.82	1.22	3.98	2.21	T.	0.48	1.96	2.59	0.21	15.45
1898	0.09	0.00	1.68	0.66	4.48	3.23	1.76	0.49	0.40	1.23	2.04	0.56	16.62
1899	1.26	0.40	0.64	0.42	0.67	T.	T.	1.00	0.30	1.71	0.10	0.82	7.32
1900	T.	0.54	0.79	1.33	1.61	0.67	0.15	0.49	1.31	1.18	0.36	0.34	8.77
1901	0.72	1.50	0.72	1.71	4.00	3.59	0.70	0.85	2.43	0.11	T.	1.50	17.83
1902	0.00	0.05	2.80	0.14	3.21	1.75	1.98	T.	T.	0.90	1.00	0.12	11.95
1903	0.12	T.	0.51	1.34	.....	.....	.....	2.65	.....	.....	.....	.....	.....
1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.30	.....
1905	0.19	0.55	.....	.....	.....	.....	1.05	0.00	0.95	0.08	1.08	0.00	.....
1906	1.45	1.20	1.10	0.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
1907	1.05	1.80	0.42	0.60	0.17	3.10	0.15	0.07	.....	.....	.....	.....	.....
1908	0.40	0.80	1.10	0.05	5.70	.....	.....	.....	.....	.....	.....	.....	.....
M'n.	0.62	0.59	0.98	0.99	2.58	2.06	1.27	0.83	0.94	0.72	1.01	0.42	13.01

HARLOWTON, MEAGHER COUNTY, MONTANA.

Elevation, 4,165 feet.

Combined with Martinsdale and Two Dot.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	0.62	2.55	1.63	0.53	1.90	4.21	2.82	0.75	1.85	2.00	1.28	1.75	21.89
1892	2.00	1.35	0.90	1.76	1.71	4.24	2.00	0.96	0.75	0.94	0.41	0.32	16.89
1893	2.60	0.55	0.45	0.69	1.76	1.78	0.99	0.11	2.61	1.20	2.35	0.90	15.99
1894	2.36	0.30	1.71	1.36	1.64	4.72	1.70	0.82	1.26	0.91	0.55	0.58	17.91
1895	1.62	1.03	1.12	0.76	0.38	1.07	1.38	1.02	2.17	T.	0.79	0.32	11.66
1896	0.65	0.10	0.65	2.80	4.00	1.71	2.53	0.40	2.49	0.01	2.10	0.10	17.63
1897	0.40	0.80	0.80	0.72	0.96	3.68	1.74	0.68	0.23	1.90	3.15	0.50	15.56
1898	0.40	0.18	1.30	0.65	4.43	4.63	1.76	0.24	1.26	0.72	1.00	0.07	16.64
1899	2.50	0.90	1.00	0.35	3.23	0.17	2.03	0.82	0.05	1.50	0.00	0.80	13.35
1900	0.20	0.70	0.40	4.75	1.74	T.	1.00	0.81	0.46	0.75	0.40	0.30	11.51
1901	0.45	0.45	1.10	1.20	3.90	5.11	1.00	1.45	2.40	0.00	0.00	1.60	18.66
1902	0.20	1.40	1.45	0.50	2.85	0.95	1.10	T.	0.50	0.50	2.50	1.80	13.75
1903	0.70	0.10	1.50	2.90	1.80	2.19	1.36	0.72	1.80	.....	.....	.....	.....
1904	1.00	2.87	1.59	.....	1.72	1.75	.....	.....	.....	.....	.....	.....	.....
1905	0.57	0.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1908	.....	.....	0.60	T.	4.10	0.33	T.	T.	0.50	1.79	0.00	0.30	.....
M'n.	1.08	0.91	1.08	1.36	2.41	2.44	1.53	0.63	1.31	0.91	1.12	0.72	15.50

HELENA, LEWIS AND CLARK COUNTY, MONTANA.

Elevation, 4,110 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1880	.....	.....	.....	2.22	1.24	0.46	0.86	1.38	T.	1.23	0.87	4.64	.....
1881	2.86	0.51	T.	1.55	1.60	3.51	1.95	1.78	2.49	2.04	1.27	0.38	19.94
1882	1.08	0.37	0.31	0.94	0.54	1.18	0.36	0.15	3.66	1.10	0.15	0.48	10.32
1883	0.57	0.73	0.73	0.53	1.54	1.74	0.32	.....	.....	.....	0.66	1.02	.....
1884	3.75	1.33	0.59	1.06	0.63	4.29	3.25	0.47	1.30	0.49	0.46	1.56	19.18
1885	1.31	0.82	0.28	1.00	0.85	4.46	1.16	0.48	0.11	0.16	0.15	0.21	10.99
1886	0.82	0.56	1.00	2.69	0.40	1.14	0.55	0.03	2.40	1.57	0.49	0.98	12.63
1887	1.35	0.61	0.12	1.93	2.41	3.48	0.27	1.86	0.50	1.01	0.22	0.29	14.05
1888	0.79	0.12	1.32	0.56	2.96	1.87	0.89	0.26	0.14	0.14	0.32	0.77	10.14
1889	0.42	0.72	0.64	0.11	2.20	0.40	0.34	0.31	0.48	0.14	0.77	0.18	6.71
1890	0.61	0.82	0.96	0.25	1.43	1.83	0.58	0.23	0.58	0.55	0.14	0.82	8.80
1891	0.31	1.68	1.37	0.76	2.51	4.67	2.73	1.02	0.72	2.40	0.82	0.40	19.39
1892	1.02	0.17	0.31	0.72	1.54	5.63	2.27	0.48	0.26	0.26	2.05	0.56	15.27
1893	1.72	0.58	0.14	2.31	3.04	0.82	0.86	0.46	2.69	0.84	1.44	0.58	15.48
1894	1.64	0.47	0.80	0.82	1.66	2.09	0.32	0.40	1.42	0.68	0.24	0.63	11.17
1895	1.95	1.69	0.29	0.53	0.87	1.30	1.18	0.14	0.57	0.28	0.77	1.12	10.69
1896	0.72	0.59	1.71	1.23	2.25	0.71	0.89	0.86	2.54	0.24	3.29	0.35	15.38
1897	0.80	1.49	1.23	1.15	1.14	3.66	1.89	0.52	0.66	0.81	2.22	0.59	16.16
1898	0.20	0.52	2.39	0.56	4.88	3.52	1.71	0.71	0.87	1.10	0.66	0.28	17.40
1898	1.60	0.53	1.37	0.70	1.98	0.84	0.63	1.26	0.64	1.45	0.26	0.62	11.78
1900	0.03	0.64	0.90	2.49	3.22	0.19	0.23	0.59	1.39	1.21	0.30	0.43	11.62
1901	0.56	0.44	1.05	1.58	4.11	1.83	0.40	0.17	2.63	0.07	0.16	1.71	14.71
1902	0.14	0.46	0.58	0.60	3.61	0.46	1.98	0.32	0.39	0.21	0.59	0.75	10.00
1903	0.69	0.09	0.92	1.57	1.64	1.09	1.90	0.83	0.90	0.28	1.09	0.36	11.36
1904	0.38	0.67	1.37	0.18	1.20	0.88	1.39	0.72	0.01	0.27	0.03	0.39	7.49
1905	0.20	0.27	0.98	0.64	2.09	2.75	1.05	0.21	0.34	0.47	0.97	0.11	10.08
1906	0.64	0.65	0.70	0.83	2.96	1.78	0.15	1.79	1.29	0.15	1.38	1.96	14.28
1907	1.29	0.74	0.64	0.80	1.04	4.20	1.28	1.00	0.81	0.58	0.13	0.23	12.74
1908	0.50	0.29	0.68	0.52	6.19	4.76	1.40	0.90	1.81	1.88	0.18	0.52	19.63
M'n.	1.00	0.66	0.83	1.06	2.13	2.26	1.13	0.69	1.13	0.77	0.76	0.79	13.21

LIVINGSTON, PARK COUNTY, MONTANA.

Elevation, 4,488 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1892	1.70	0.50	0.55	T.	.....	.....	.....	.....	.....	.....	.....	.....	.....
1895	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.43	1.97	0.53	.....
1896	0.37	0.10	1.26	0.70	2.40	0.35	0.59	0.15	2.37	0.83	1.56	T.	10.68
1907	0.44	0.35	0.49	0.52	0.60	3.30	1.63	T.	0.43	1.80	1.66	0.55	11.77
1898	T.	0.23	1.20	1.04	4.03	4.28	1.23	1.26	0.61	1.32	0.78	0.10	16.08
1899	1.06	1.26	1.20	0.50	.....	.....	.....	.....	.....	.....	0.46	1.20	.....
1900	T.	0.14	0.44	3.00	2.00	0.00	0.01	0.05	0.90	1.20	0.03	0.40	11.17
1901	0.40	0.01	0.05	0.77	8.00	1.65	0.30	0.62	2.10	0.25	0.23	1.12	15.50
1902	0.04	0.29	0.18	1.90	0.76	1.75	0.25	1.00	0.80	.....	.....	0.13	.....
1903	0.25	0.01	0.01	0.10	2.25	3.24	.....	.....	1.75	0.42	1.44	0.58	.....
1904	0.21	1.80	1.38	1.06	1.90	.....	.....	.....	.....	0.20	0.09	0.45	.....
1905	0.32	0.45	0.77	1.11	3.05	3.12	1.57	1.22	0.55	1.67	1.20	0.25	15.28
1906	0.79	0.70	1.54	1.57	2.08	1.54	0.89	2.56	1.06	1.07	1.04	0.54	15.58
1907	1.17	1.00	2.43	1.60	3.93	1.62	4.26	1.33	1.44	0.65	0.34	0.19	19.96
1908	0.39	0.67	0.87	1.72	9.60	1.89	0.36	0.59	0.91	2.21	0.28	0.31	19.80
M'n.	0.51	0.54	0.88	1.20	3.38	2.07	1.11	0.88	1.17	1.00	0.85	0.42	14.01

TOSTON, BROADWATER COUNTY, MONTANA.

Elevation, 3,950 feet.

Combined with Radersburg, Mont.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	.....	0.31	2.10	3.35	1.29	0.15	1.05	2.05	0.15	0.38	.....
1895	0.53	0.02	T.	0.24	0.42	1.57	.....	.....	1.75	.....	T.	2.50	.....
1896	0.32	0.20	0.20	2.52	1.55	.....	2.05	1.25	2.00	0.60	0.85	.....	.....
1897	0.50	0.75	0.40	1.75	1.50	4.03	2.05	.....	2.75	1.35	1.23	.....	.....
1898	0.25	00.0	0.58	0.10	2.10	0.95	0.40	0.50	.....	2.00	0.24	0.10	.....
1901	.....	.....	.....	.....	.....	.....	.....	0.63	1.76	T.	0.05	.....	.....
1902	0.03	0.76	.....	.....	3.17	1.12	1.41	0.61	0.29	0.14	0.20	0.87	.....
1903	0.11	0.02	0.56	0.10	0.75	1.39	1.24	0.63	0.90	T.	2.66	0.25	8.61
1904	.....	1.70	.....	0.47	1.40	.....	1.79	0.33	T.	T.	2.66	0.25	8.61
1905	0.10	T.	T.	.....	1.43	1.78	0.56	0.76	0.65	T.	0.10	0.00	.....
1906	.....	.....	0.56	0.15	2.04	2.17	0.28	.....	.....	0.19	0.65	.....	.....
1907	.....	.....	0.61	0.30	1.63	2.86	1.70	1.28	0.69	0.44	T.	0.65	.....
1908	0.10	0.50	0.55	0.13	2.70	3.10	0.55	0.68	0.63	0.48	T.	0.05	9.47
M'n.	0.24	0.44	0.38	0.64	1.73	2.23	1.21	0.68	1.13	0.60	0.47	0.60	10.32

VIRGINIA CITY, MADISON COUNTY, MONTANA.

Elevation, 5,880 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1871	.....	0.48	1.97	1.47	.....	.....	.....	.....	.....	.....	0.30	1.43	.....
1872	1.45	0.79	0.20	0.46	1.78	0.74	2.73	0.60	0.28	0.12	0.52	0.16	9.83
1873	0.13	0.19	.....	.....	.....	0.71	2.02	2.40	.....	0.13	0.09	0.06	.....
1874	0.11	0.06	0.14	0.10	4.18	3.58	1.10	3.11	1.46	1.12	1.04	0.16	16.16
1875	1.29	1.37	1.50	0.30	4.61	1.54	0.73	2.94	1.25	0.81	0.91	0.22	17.47
1876	0.59	0.49	1.06	0.84	5.58	2.65	1.96	1.56	0.88	0.91	0.20	0.91	17.63
1877	0.56	0.73	1.35	1.38	3.93	2.08	1.79	0.23	2.70	1.39	1.19	0.14	17.47
1878	0.45	0.62	0.91	1.83	5.13	3.78	0.88	2.16	1.36	0.98	0.31	0.65	19.06
1879	0.96	1.06	1.51	1.45	2.16	3.71	0.28	0.23	0.51	1.23	0.91	3.83	17.84
1880	1.15	1.13	1.94	3.87	4.01	2.69	2.06	0.82	0.14	2.46	1.29	.....	.....
1888	0.03	.....	.....	.....	1.53	3.30	0.55	0.88	0.57	0.23	1.28	0.03	.....
1889	0.06	0.11	0.92	0.63	1.98	0.23	0.06	1.23	0.29	0.48	0.40	0.69	7.08
1890	0.87	0.91	0.51	0.26	0.89	2.35	0.24	1.22	0.70	1.06	0.06	0.70	9.77
1891	0.34	0.78	0.63	1.00	1.37	5.04	3.15	0.39	1.37	0.29	0.12	0.65	15.13
1892	0.27	0.04	0.31	1.40	0.54	2.83	1.16	0.61	0.82	1.00	2.09	1.95	13.02
1893	0.31	0.53	0.34	0.76	1.12	0.93	0.74	0.70	3.91	1.06	0.29	0.69	11.38
1894	0.45	0.28	1.13	1.94	1.01	3.49	2.81	1.31	2.73	0.85	T.	0.58	16.58
1895	0.99	0.06	1.03	0.94	1.42	2.12	1.00	0.83	2.04	0.19	0.76	1.28	12.66
1896	0.67	0.65	0.98	2.15	4.28	1.25	1.19	0.86	1.73	0.72	1.84	0.25	16.57
1897	0.21	1.28	2.35	1.29	2.91	3.22	1.43	0.52	1.64	1.75	1.77	1.10	19.47
1898	0.74	0.33	2.08	0.74	.....	.....	.....	.....	.....	.....	.....	.....	.....
1905	0.20	0.15	0.69	0.78	2.12	1.52	1.55	1.10	0.85	1.31	0.53	0.28	11.08
1906	1.20	0.64	0.65	1.81	5.31	3.40	0.68	2.19	.....	.....	.....	.....	.....
M'n.	0.59	0.58	1.06	1.21	2.80	2.44	1.34	1.23	1.33	0.90	0.76	0.79	15.03

MEAN TEMPERATURE.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Agricultural College*	29	20.0	23.2	29.8	40.3	50.0	58.7	65.8	64.3	53.5	43.4	30.5	23.1	43.5
Anaconda	7	23.7	26.8	31.0	41.4	48.4	54.1	63.5	62.0	54.1	46.7	34.8	27.1	42.8
Boulder	14	20.0	21.7	23.2	41.5	49.5	55.9	62.9	62.8	52.2	42.9	31.1	24.7	41.1
Bowen	2	5.6	13.2	23.3	36.4	45.0	48.4	57.0	52.6	48.2	39.0	28.6	12.0	34 1
Butte	14	23.5	24.9	29.2	40.5	48.3	55.1	63.4	62.8	52.9	44.5	33.7	26.6	42.1
Canyon Ferry	10	21.8	22.1	32.4	45.2	53.8	60.4	68.0	66.0	56.0	45.8	31.8	24.2	44.0
Dillon	11	24.0	26.6	32.4	43.0	51.5	57.4	63.6	62.4	53.4	45.9	34.6	27.0	43.5
East Anaconda	3	22.0	28.6	27.3	41.0	45.0	51.7	64.6	60.7	55.1	46.1	32.9	27.0	41.8
Fort Logan	24	17.6	20.6	27.5	39.1	48.1	55.8	63.1	61.6	51.1	39.4	27.7	20.5	39.3
Harlowton†	14	23.4	20.9	28.7	41.4	51.0	57.5	65.2	64.0	48.1	44.0	31.7	26.5	41 9
Helena	28	20.0	22.7	31.7	42.1	51.8	59.1	66.9	66.2	56.2	45.8	32.5	26.3	43.6
Livingston	11	25.8	28.2	31.7	42.1	51.6	58.9	67.8	66.9	57.6	48.6	35.9	30.9	45.5
Manhattan	8	22.0	23.8	30.2	43.6	53.0	59.8	62.9	65.0	52.1	42.2	29.4	21.4	42.1
Marysville	13	20.9	21.9	25.7	40.4	47.4	55.0	62.9	62.1	51.5	43.0	29.8	25.9	40.5
Red Lodge	9	23.2	22.0	26.6	39.6	46.0	55.6	61.2	60.7	52.4	42.9	33.0	25.8	40.8
Renova‡	9	24.6	25.3	33.4	43.9	51.3	58.3	65.4	64.3	55.8	46.6	37.0	28.3	44.6
Toston	7	22.0	25.7	32.6	43.9	52.3	57.2	65.0	64.4	54.7	44.9	32.2	23.3	43.2
Utica	14	23.7	24.2	27.8	41.7	50.2	57.4	64.8	65.1	56.3	46.1	33.8	28.3	43 3
Virginia City	20	20.3	23.6	28.6	40.0	47.6	55.5	64.5	64.0	53.5	43.2	29.9	23.1	41.2
Wolf Creek	5	21.8	25.6	30.5	43.0	48.3	56.1	63.3	63.2	56.1	48.0	34.5	30.5	43.4
Yale	11	22.3	23.1	28.1	41.3	49.6	57.4	64.8	64.7	53.6	43.3	31.6	27.2	42.2
Yellowstone Park	22	19.2	19.9	26.6	37.1	46.1	53.8	64.7	61.0	52.4	41.6	29.8	21.9	39.5

AVERAGE NUMBER OF DAYS WITH .01 INCH OR MORE OF PRECIPITATION.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Agricultural College*	32	6	6	8	10	12	11	7	5	5	6	6	6	88
Anaconda	7	5	4	5	5	9	8	6	4	5	4	4	5	64
Boulder	11	5	4	6	6	8	8	6	4	6	3	4	4	64
Bowen	2	8	8	10	4	8	12	8	6	5	6	5	10	90
Butte	14	6	5	7	6	9	9	5	5	4	3	4	5	68
Canyon Ferry	10	5	5	7	5	12	8	7	6	4	5	4	5	73
Copper	3	7	7	7	8	14	13	8	7	7	5	5	9	97
Dillon	10	6	6	10	10	13	13	8	9	6	6	6	6	99
East Anaconda	3	6	5	6	6	13	15	8	7	7	7	4	5	89
Fort Logan	7	3	5	4	4	8	7	3	2	4	4	4	3	51
Harlowton†	7	4	4	7	5	6	4	4	2	3	4	3	3	49
Helena	28	9	7	8	8	12	12	8	5	7	6	7	8	97
Homepark	4	2	3	5	7	9	9	3	4	2	2	2	5	53
Livingston	9	3	4	6	7	12	9	4	5	5	5	4	4	68
Manhattan	5	2	3	4	5	8	6	3	4	4	4	2	4	49
Marysville	9	8	7	8	7	14	10	8	6	5	5	7	9	94
Nye	4	7	7	10	11	15	13	9	10	6	5	5	4	102
Red Lodge	8	5	4	5	7	12	9	5	6	4	4	3	4	68
Renova‡	10	2	3	5	7	11	9	6	4	4	4	2	3	60
Toston	6	4	2	2	2	8	9	5	4	2	1	2	2	43
Utica	11	4	3	5	7	11	10	8	6	5	4	3	4	70
Wolf Creek	5	8	7	9	9	12	10	8	4	4	5	5	4	85
Yale	9	4	5	6	4	11	8	7	4	4	4	4	4	65
Yellowstone Park	22	10	8	11	8	12	11	9	8	6	7	8	10	108

*Agricultural College combined with Fort Ellis.

†Harlowton combined with Martinsdale and Two Dot.

‡The station at Renova was formerly designated "Parrot."

PREVAILING WIND DIRECTION.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Agricultural College	se.	se.	se.	sw.	se.	nw.	se.	se.	se.	se.	se.	se.	se.
Boulder	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Butte	nw.	w.	nw.	nw.	nw.	nw.	w.	w.	nw.	nw.	nw.	nw.	nw.
Canyon Ferry	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Copper	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Dillon	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Fort Logan	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Grayling	sw.	sw.	sw.	sw.	w.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Harlowton	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Helena	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Livingston	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Marysville	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Red Lodge	se.	se.	se.	nw.	nw.	se.	se.	se.	se.	se.	se.	se.	se.
Renova	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Utica	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Virginia City	sw.	sw.	sw.	w.	w.	w.	se.	w.	se.	sw.	sw.	se.	sw.
Yellowstone Park	s.	s.	s.	s.	s.	s.	sw.	s.	s.	sw.	s.	s.	s.

MEAN RELATIVE HUMIDITY.

		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Helena	8 a. m.	72	73	71	65	66	67	60	59	64	66	68	71	67
	8 p. m.	66	63	56	42	42	41	31	30	39	48	56	65	48
Yellowstone Park	8 a. m.	77	74	77	74	77	74	77	73	71	74	70	76	74
	8 p. m.	71	64	65	48	51	46	36	38	40	55	58	49	53

From observations made at 8 a. m. and 8 p. m., 75th meridian time.

FROST DATA.

Stations.	Length of Record, Years.	Average Date of First Killing Frost in Autumn.	Average Date of Last Killing Frost in Spring.	Earliest Date of Killing Frost in Autumn.	Latest Date of Killing Frost in Spring.
Agricultural College	8	September 7	May 28	August 9	June 20
Anaconda	4	September 6	June 17	August 14	July 8
Boulder	8	September 5	June 19	August 8	July 14
Butte	14	September 15	June 5	September 5	June 26
Canyon Ferry	10	September 18	May 13	September 8	June 7
Copper	4	August 3	June 11	July 5	July 1
Dillon	9	September 1	June 9	August 10	July 7
East Anaconda	3	September 6	May 30	August 14	June 20
Fort Logan	12	August 30	June 16	August 10	July 20
Harlowton	15	September 4	June 6	August 8	July 1
Helena	35	September 28	May 7	September 5	June 9
Livingston	8	September 17	May 20	September 5	June 20
Manhattan	8	August 27	June 6	August 9	July 1
Marysville	13	September 11	June 8	August 25	July 21
Red Lodge	6	September 6	June 16	August 21	June 28
Renova	10	September 14	May 27	August 19	July 15
Toston	7	September 8	June 3	August 12	June 20
Virginia City	6	September 16	June 15	September 4	July 4
Wolf Creek	5	September 16	May 31	September 11	June 20
Yale	8	September 11	June 10	August 21	June 28

AVERAGE SNOWFALL.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Agricultural College.	6	9.0	11.3	15.1	9.8	1.1	0.0	0.0	0.0	0.5	6.1	9.7	8.5	71.1
Boulder	9	6.7	4.8	4.9	4.2	1.1	T.	0.0	0.0	1.1	0.9	2.3	4.4	30.4
Bowen	3	16.5	13.0	11.4	4.3	0.0	0.0	0.0	T.	0.0	4.0	2.8	18.1	70.1
Butte	14	8.8	8.0	10.9	7.9	3.5	0.8	T.	T.	0.4	2.1	5.0	7.8	55.2
Canyon Ferry	9	4.8	4.6	4.9	0.7	0.4	T.	0.0	0.0	T.	1.0	4.2	4.8	25.4
Copper	4	13.4	11.4	14.7	3.8	4.0	0.9	0.0	0.0	2.0	9.7	7.3	7.8	75.0
Dillon	9	8.1	5.0	11.5	12.9	4.5	T.	0.0	0.0	0.7	3.9	5.7	5.9	58.2
East Anaconda	4	13.4	8.2	8.1	4.4	2.4	0.8	0.0	0.0	0.3	0.8	3.8	6.9	49.1
Harlowton	6	7.4	9.0	11.9	4.8	5.6	0.0	0.0	0.0	1.8	2.3	9.1	8.0	59.9
Helena	29	11.5	8.0	9.6	5.8	1.4	T.	0.0	0.0	0.6	3.1	6.6	8.1	54.7
Livingston	11	7.4	6.4	7.5	3.8	1.7	T.	0.0	0.0	1.0	3.4	4.8	4.4	40.4
Marysville	10	16.2	13.5	18.8	8.1	5.9	0.5	T.	0.2	1.6	5.4	14.9	15.0	100.1
Nye	4	13.9	13.6	21.5	24.2	18.1	1.2	0.0	0.0	3.5	12.9	4.6	4.5	118.0
Red Lodge	6	8.6	13.3	20.8	23.8	17.9	1.0	0.0	0.0	5.3	8.5	8.3	8.3	115.8
Renova	9	5.4	3.8	4.9	4.8	0.6	T.	0.0	0.0	T.	1.4	1.7	2.0	24.6
Utica	11	8.0	3.5	8.6	6.5	5.8	T.	0.0	0.0	0.3	8.6	6.0	7.3	54.6
Wolf Creek	4	7.8	8.6	10.2	4.1	3.7	T.	0.0	0.0	0.9	1.3	7.0	4.5	48.1
Yale	8	7.1	6.6	14.1	2.6	1.8	0.0	0.0	0.0	0.8	2.6	7.9	7.8	51.3
Yellowstone Park ..	21	22.3	17.2	19.1	7.8	4.1	0.9	T.	T.	1.6	5.4	11.8	15.0	105.2

Hydrographic Data for Section 27, Summary of Climatological Data for the United States.

Compiled from the Records of the United States Geological Survey by R. H. Bolster, Assistant Engineer.

Preliminary Note:—Only the broader facts concerning the rivers are here given. Information in more detail can be procured on application to the Director, United States Geological Survey, Washington, D. C.

This section comprises the headquarters of the Missouri River in the westerly portion, and portions of Musselshell and Yellowstone River drainages in the easterly portion.

Missouri River proper is formed in southwestern Montana by the union of three streams which were discovered by Lewis and Clarke in 1806, and named by them Jefferson, Madison and Gallatin rivers. Jefferson and Madison forks come together first, and then in about two miles are joined by the Gallatin. Each of the three headwater rivers is about 90 feet wide, flows with great velocity and discharges large quantities of water. The beds of all are formed of smooth pebbles and gravel and the waters are perfectly transparent. From the junction of the three forks, the course of the Missouri lies through mountain valleys and deep canyons from which it finally issues through a gorge in a range of rocks called by Lewis and Clark the Gates of the Rocky Mountains.

The catchment areas of the rivers which form the Missouri are somewhat similar in character being in the main timbered mountain lands with steep slopes scantily covered with soil, the minor basins, however, becoming more open and less elevated toward the western portion of the Jefferson drainage. The west or main branch of the Gallatin heads in the northwestern corner of Yellowstone National Park in a number of small lakes at an elevation of almost two miles above sea level. The river has a rapid fall flowing with a swift current through short and narrow val-

leys in a rocky channel and between high banks, the greater part of its course being in gorges. It finally issues from its canyon upon a broad fertile plain, the greater portion of which lies between the eastern and western Gallatin rivers and the foothills of the mountains, a magnificent stretch of country containing over 250 square miles of the richest farming land in the State. The elevation of this valley is from 4,100 to 5,400 feet.

The Madison River also rises in the National Park receiving the drainage of the geyser basins through the Firehole River. The upper catchment area while similar to that of the Yellowstone and Gallatin is perhaps less steep and less heavily wooded. After leaving the mountains, the river enters the narrow Madison Valley. This open land has a length of about 40 miles, is over 3-4 to 1 1-2 miles wide, bounded by benches on either side, the elevation being a little over 5,000 feet. The fall of the river is approximately 18 feet per mile, the channel rocky and gravelly, the banks generally low on the righthand side and rising in high bluffs on the left. The stream is usually clear and nearly free from sediment excepting in flood. At the lower end of the valley the river enters a canyon about 10 miles in length and finally flows out on the western prolongation of the Gallatin Valley which it crosses to join the other rivers in forming the Missouri. This river is more constant in its flow than is usually the case wtih rivers of the arid region, this steadiness being due primarily to the perennial supply from the head springs in the National Park.

Jefferson River has a much larger but lower catchment basin than the two rivers just mentioned, the average elevation probably being not over 6,000 feet. The valleys are broad open country extending nearly the whole distance from the junction of the three rivers up to the point where the Jefferson is in turn formed by the union of the Bigbee and Beaverhead rivers.

The headwaters of Musselshell River are on the southern side of the Little Belt Mountains, many springs coming from the Elk Mountains on the west and the Crazy Mountains on the south. This stream receives its water from broad basins partly encircled, rising from heights of over 6,000 to 9,000 feet. The general elevation of this upper valley is a little over 4,000 feet. They are comparatively well-watered, many streams issuing from the mountains at small intervals.

Yellowstone River rises in the National Park to which the stream has given its name, flows north through deep canyons into the State of Montana and then pursues a generally northeasterly course to the junction with the Missouri near Fort Buford, a few miles east of the State line between North Dakota and Montana. After leaving the Great Mountains below the National Park, the river flows through a narrow valley. At the north end of this valley the river passes through the lower canyon and shortly below this locality takes a general course to the east, the lowlands becoming wider and well adapted for agricultural purposes. The river partially encircles the north end of the Absaroka range receiving from these lofty mountains a great number of streams which flow out

towards almost every point of the compass, emptying directly into the Yellowstone, or uniting form such large tributaries as Clark Forke. These streams carry perennial supplies of water which are utilized wherever possible upon the lowlands in the narrow valleys.

The following table shows in a general way the stream flow which can be expected to prevail for a given month of an average year. Opposite each amount is given: First, the maximum flow for a 24-hour period which has been observed during the period covered by the table; second, the minimum flow for a 24-hour period which has been observed during the period covered by the table; third, the mean flow for that month during the entire period covered by the table. The remaining columns are computed from the third column of mean monthly discharge. Column 4 gives the mean flow for the entire period in cubic feet per second per square mile on the assumption of a uniform rate of discharge from each square mile of the drainage area. Column 5 gives the depth in inches to which the entire drainage area would be covered in an average month, if all the water flowing from it during that month were conserved and uniformly spread over the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches. And similarly in column 6, the discharge in acre feet indicates the number of acres of land which would be covered to a depth of one foot, if the total run-off during the month were spread uniformly over the area.

MONTHLY DISCHARGE OF MISSOURI RIVER, CASCADE, MONTANA.
For Periods January, February, 1903–06; March, 1903–07; April, June, 1902–08; July, November 1902–08; December, 1902–07.
(Drainage area 18,300 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square Mile.	Depth in Inches on Drainage Area.	Total in Acre Feet.
January	.....	.....	3,380	.185	.21	208,000
February	.....	.....	3,080	.168	.17	171,000
March	7,950	3,340	4,030	.220	.25	248,000
April	31,100	3,120	6,110	.334	.37	364,000
May	21,800	3,450	9,290	.508	.59	571,000
June	49,300	4,060	18,700	1.020	1.14	1,110,000
July	28,700	2,600	8,440	.461	.53	519,000
August	11,600	1,800	3,130	.171	.20	192,000
September	5,340	1,720	2,860	.156	.17	170,000
October	8,170	1,720	3,740	.204	.24	230,000
November	9,000	2,350	4,080	.223	.25	243,000
December	.....	.....	3,870	.212	.24	238,000
The Period	.....	.....	5,890	.322	4.36	4,260,000

MONTHLY DISCHARGE OF JEFFERSON RIVER, SAPPINGTON, MONTANA.

For Periods March, 1898, 1900-01-03-05; April, October, 1897-1905; November, 1898-1905; December, 1900-05.

(Drainage area, 8,980 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square Mile.	Depth in Inches on Drainage Area.	Total in Acre Feet.
March	2,490	1,150	1,620	.180	.21	99,600
April	7,150	875	2,590	.288	.32	154,000
May	11,000	978	5,480	.610	.70	337,000
June	15,500	1 180	5,780	.644	.72	344,000
July	11,200	600	2,530	.282	.33	156,000
August	2,480	465	871	.097	.11	53,600
September	1,620	430	813	.090	.10	48,400
October	2,170	545	1,120	.125	.14	68,900
November	6,440	975	1,660	.185	.21	98,800
December	5,520	1,100	1,680	.187	.22	103,000
The Period	.....	.....	.....	.....	.....	1,460,000

MONTHLY DISCHARGE OF MUSSELSHELL RIVER, SHAWMUT, MONTANA.

For Periods March November, 1905; April, September, 1906.

Months.	Discharge in Second-Feet.			Run-Off.
	Maximum.	Minimum.	Mean.	Total in Acre Feet.
March	245	71	113	6,950
April	340	178	162	9,640
May	450	46	171	10,500
June	1,580	103	428	25,500
July	1,330	7	88.9	5,470
August	410	2	29.4	1,810
September	40	2	15.6	928
October	71	4	26.7	1,640
November	71	46	59.8	3,560
The Period	.....	.....	.....	66,000

Section 28.—WESTERN MONTANA.

Description of Topography, Resources, Etc.

Climatological Section No. 28 comprises that portion of Montana lying west of the continental divide, and covers an area of approximately 24,000 square miles, extending from latitude 46° 30′ north to the Canadian boundary. It lies wholly within the upper Columbia drainage basin, and is the source of two important tributaries of this stream. Its boundary line is formed mainly by two high mountain ranges, namely the main range of the Rockies east and south and the Bitter Root Mountains on the west. The basin enclosed within these mountains is very broken and mountainous, there being many groups and ranges, of varying extent and elevation, the most important of which are the Purcell, Cabinet, Coeur d'Alene, Mission and Kootenai ranges.

The principal tributaries of the Columbia in Montana are the Clarke Fork, formed by the confluence of the Missoula and Flathead rivers, and the Kootenai River, which enters the state from Canada and flows across the northwest corner of the district. The northern half is drained by the eastern part, and the southern half by the Missoula, the principal tributaries of which are the Bitter Root and Hellgate rivers. Most of the streams traverse narrow canyons through a part of their courses, but broaden out here and there into valleys of considerable extent, having for the most part elevations below 3,000 feet. The canyons afford innumerable valuable sites for water power plants, and the possibilities in this line of industry are incalcuable. Only a small percentage of the available power resources have been developed.

The mountains of this section are mostly covered with heavy forests, which in many places extend down to the edges of the valleys, but the valleys proper have but scant timber growth.

The most important agricultural sections are the Bitter Root, Flathead and Missoula valleys. The soil and climate of these valleys are well adapted to intensive farming, especially along the line of horticulture, an industry which has made rapid development during the past few years. Many of the hardier varieties of apples, as well as the crab, cherry, and other small fruits are produced to a high state of perfection, and the lands advantageously situated for this industry have become quite valuable. All the cereals, together with alfalfa, timothy, and other forage grasses, are grown with marked success. Abundant crops of all the staple vegetables are raised, the conditions being especiaally adapted to potatoes. sugar beets and cabbage.

Climatic Characteristics.

The climate of this section differs in some important respects from that immediately east of the continental divide in Montana. The winter temperatures are on the whole milder, the precipitation somewhat greater and differently distributed through the year, and cloudy weather is more prevalent.

The annual mean temperature for the section is about 42 degrees. In the valleys it ranges from 42 to 45 degrees, which shows a marked uni-

formity in this element of the climate. The average seasonal temperatures for the section are 24 degrees in winter, 41 degrees in spring, 61 degrees in summer, and 44 degrees in autumn. Maximum temperatures above 90 degrees are of common occurence in July and August, but temperatures as high as 100 degrees are comparatively rare. In the higher valleys, adjacent to high mountains, minimum temperatures below freezing are apt to occur at any season of the year. Winter minimum temperatures below —20 degrees do not often occur in the valleys.

This section lies south of the normal path of high and low areas, and as a result it is comparatively free from sudden and marked changes in temperature. The most marked changes are from extreme cold to mild temperatures in winter months due to chinook winds.

The length of the period between the last killing frost in spring and the first in autumn varies considerably, depending on the altitude and other local conditions. In some of the narrow elevated valleys there are on the average only fifty to eighty days without frost temperatures. In the Flathead Valley there are about 150 days; in the Bitter Root Valley, 135 days, and in the Missoula Valley, 125 days without injurious frosts, and if we take into consideration the fact that damaging frosts may occur on the immediate surface of the ground, with temperatures that would cause no injury at a height of a few feet above, owing to the lower dew point, the periods free from frosts injurious to tree fruits are probably considerably longer than those noted above.

In the fruit growing districts the last killing frost in spring usually occurs from the 10th to the 13th of May, and the first in autumn varies from September 15th to October 14th, the latest being the record on the shore of Flathead Lake, a body of water of approximately 150 square miles in area, at an elevation of 2,916 feet above sea level.

The average annual precipitation of the thirteen stations of longest record is 17.53 inches. Most of these records are for elevations ranging from 1,900 to 3,500 feet elevation, and are therefore typical of valley, rather than mountain conditions. The annual amounts for these stations vary about 11 to nearly 33 inches. The driest sections are the Bitter Root and lower Missoula valleys, where the annual amounts fall below 15 inches. The distribution throughout the year is somewhat more uniform than for that part of Montana east of the continental divide. The spring and summer rainy season begins about May 1st, and extends well towards the middle of July, and there is a second maximum precipitation period beginning in November and ending in January. The driest months are April and August, the only periods when the average for the section falls below one inch.

In the higher mountain regions the snowfall is exceedingly heavy, and snow accumulates to great depths during the long winters, affording an abundant and perennial flow of water in the innumerable streams that have their sources in the mountains of this section.

R. F. YOUNG, Section Director.

MONTHLY AND ANNUAL PRECIPITATION.

MISSOULA AND FORT MISSOULA, MISSOULA COUNTY, MONTANA.

Elevation, 3,212 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1870	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.15	0.35	.....
1871	0.76	0.00	1.47	1.37	0.83	0.51	0.97	0.00	0.00	0.65	2.54	7.24	16.34
1872	0.97	1.26	1.08	0.21	3.64	0.68	0.98	.....	0.00	.....	0.81	3.44	.....
1873	4.60	0.60	1.20	1.40	3.92	0.89	1.07	0.38	1.51	0.24	0.61	0.00	.....
1874	2.25	1.30	1.15	0.00	8.58	3.55	.....	.....	.....	.....	2.05	1.18	.....
1875	1.41	1.54	2.89	0.78	1.55	4.83	1.85	3.58	.....	3.98	2.78	2.46	.....
1876	0.92	0.00	0.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.13	.....
1881	8.22	2.40	0.47	1.38	0.29	2.75	0.71	0.18	1.05	1.06	0.80	1.25	20.56
1882	1.18	0.80	0.71	0.65	0.96	1.51	0.63	0.31	0.83	4.07	0.64	0.95	13.24
1883	1.95	0.69	1.49	0.71	0.73	.....	.....	.....	.....	.....	.....	.....	.....
1886	1.92	0.49	0.37	1.04	0.51	1.58	0.60	0.30	1.08	0.58	5.00	1.90	15.37
1887	1.26	0.98	0.24	1.95	0.46	3.98	0.69	1.14	0.36	1.36	0.58	0.38	13.38
1888	0.80	0.22	0.20	T.	0.20	3.38	1.23	.....	0.33	0.28	0.08	0.28	.....
1889	0.03	1.14	1.02	0.96	1.48	1.00	0.00	0.00	0.33	1.27	1.21	0.71	9.15
1890	0.73	1.70	1.13	0.87	1.92	3.10	0.32	1.05	0.76	0.60	0.60	0.61	13.39
1891	0.47	3.09	3.72	0.65	1.97	3.40	2.60	0.10	1.39	0.90	2.32	1.82	22.43
1892	1.59	0.27	0.60	1.57	1.37	2.77	0.55	0.35	0.33	0.60	0.93	2.20	13.13
1893	1.95	1.96	0.16	2.00	2.13	1.48	1.42	0.65	2.50	3.01	1.78	3.32	22.36
1894	1.96	0.22	1.33	0.61	1.43	1.88	1.02	1.39	1.32	1.56	1.16	1.06	14.94
1895	1.54	0.22	0.19	0.35	1.06	1.19	1.51	0.23	1.04	0.16	0.58	1.52	9.59
1896	1.41	0.49	1.09	0.65	1.73	0.86	0.58	1.42	1.74	1.13	1.92	0.50	13.52
1897	0.73	1.24	0.42	1.46	1.09	3.88	2.14	0.83	3.42	1.24	2.30	1.23	19.98
1898	0.51	1.21	0.66	1.57	4.80	1.50	0.76	0.29	1.40	0.87	1.05	0.33	14.95
1899	0.73	1.36	2.04	1.15	1.58	1.28	1.05	1.96	1.60	1.02	1.30	1.23	16.30
1900	0.15	0.37	0.37	1.02	4.19	2.78	0.50	1.90	2.25	0.72	1.05	1.07	16.37
1901	1.45	0.55	1.41	1.13	3.84	1.68	0.00	0.00	1.50	0.47	0.69	2.23	14.95
1902	0.46	0.64	0.40	1.44	4.53	0.48	3.50	0.25	0.46	0.25	1.94	2.11	16.46
1903	0.90	0.29	1.28	0.65	1.50	2.24	1.10	1.10	1.75	1.19	1.34	0.87	14.21
1904	0.40	1.57	1.97	0.64	1.20	0.68	0.31	0.21	0.03	0.68	0.12	0.95	8.76
1905	0.67	0.20	2.22	0.46	1.94	3.48	1.13	0.57	1.10	1.26	0.65	0.23	13.91
1906	0.85	0.26	0.81	0.20	2.91	2.50	0.23	1.76	T.	1.50	3.45	1.72	16.28
1907	2.94	1.05	0.75	1.33	0.20	4.41	1.12	1.78	1.04	0.19	0.22	0.31	15.34
1908	T.	0.68	1.27	1.25	4.99	4.08	1.27	0.36	2.74	1.08	0.23	0.49	18.44
1909	1.86	0.09	1.49	1.19	0.99	2.65	3.52	0.34	2.38	0.34	1.39	0.11	16.35
M'n.	1.44	0.88	1.10	0.96	2.14	2.29	1.15	1.80	1.18	1.11	1.32	1.47	15.84

ANACONDA, DEER LODGE COUNTY, MONTANA.

Elevation, 5,300 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	.....	0.50	0.98	3.91	1.01	0.74	1.71	1.19	0.87	0.19	.....
1901	.....	.....	0.49	1.58	2.27	2.68	T.	T.	1.17	0.21	0.25	2.26	.....
1902	0.39	0.75	1.08	0.90	0.86	1.32	1.75	0.01	T.	T.	0.79	1.18	9.03
1903	0.85	0.06	0.95	0.25	.....	.....	.....	0.57	1.37	.....	.....	.....	.....
1904	0.60	.....	0.95	0.20	.....	T.	.....	0.50	T.	T.	T.	0.80	.....
1905	0.70	0.40	0.95	0.42	.....	1.49	.....	.....	.....	0.56	0.45	0.05	.....
1906	0.89	1.22	0.81	1.20	3.37	0.87	0.59	1.73	0.85	0.71	1.33	1.50	15.07
1907	0.99	0.82	1.08	0.75	0.58	4.12	2.80	1.97	1.37	0.30	0.11	0.40	14.89
1908	0.62	0.42	0.47	0.44	5.90	4.28	1.60	0.70	1.99	1.96	0.28	0.23	18.89
1909	2.48	0.21	1.45	1.08	2.08	2.55	2.62	0.62	2.35	0.23	1.41	0.56	17.64
M'n.	0.94	0.55	0.91	0.73	2.29	2.36	1.42	0.76	1.20	0.57	0.61	0.80	13.14

DEER LODGE, POWELL COUNTY, MONTANA.
Elevation, 4,768 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1869	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.41	0.56	.....
1870	0.64	1.05	1.11	1.47	3.55	3.85	0.28	0.68	1.62	0.66	1.17	0.42	16.50
1871	0.46	0.88	1.30	1.32	2.29	1.07	1.20	0.55	.....	0.79	.....	1.51	.....
1872	1.11	0.28	1.26	0.48	2.07	1.81	1.16	2.32	1.05	0.17	0.82	1.65	14.18
1873	0.65	.....	.....	2.25	3.05	1.38	0.95	0.61	0.85	0.40	0.64	0.28	.....
1881	.....	.....	0.02	0.64	0.61	2.55	0.77	0.24	0.92	0.75	0.57	0.58	.....
1882	1.44	0.70	0.47	1.67	1.92	1.73	0.74	1.16	1.49	0.85	0.08	0.74	12.99
1883	0.90	0.21	0.55	0.15	1.04	0.80	.....	.....	.....	.....	.....	.....	.....
1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.10	.....
1892	1.26	0.35	0.06	1.23	0.69	5.46	1.30	1.80	0.23	0.02	0.50	.....	.....
1893	0.84	0.30	0.16	1.18	0.98	.....	.....	.....	.....	3.39	0.93	0.85	.....
1894	0.83	0.11	6.56	1.18	.....	.....	.....	.....	.....	.....	.....	0.20	.....
1895	2.06	0.59	0.62	0.51	0.64	.....	.....	.....	.....	.....	0.02	0.11	.....
1896	0.42	0.44	0.86	0.90	1.62	.....	.....	.....	.....	.....	.....	0.22	.....
1897	0.34	0.38	0.77	0.24	0.70	.....	.....	.....	.....	.....	1.53	0.61	.....
1898	0.10	0.52	1.81	0.60	2.83	.....	.....	.....	.....	.....	.....	.....	.....
1899	.....	2.30	0.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1900	0.04	0.13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	.....	.....	.....	.....	.....	.....	.....	0.00	3.00	0.00	0.25	1.09	.....
1902	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.06	.....
1903	0.05	0.05	0.10	.....	.....	.....	.....	.....	.....	.....	1.64	0.11	.....
1904	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1905	.....	.....	.....	.....	.....	.....	.....	0.02	0.31	0.29	0.77	0.27	.....
1906	0.38	0.19	0.47	0.59	.....	.....	.....	.....	1.78	.....	0.80	.....	.....
Mns.	0.72	0.53	0.69	0.96	1.69	2.33	0.91	0.82	1.25	0.73	0.72	0.55	11.90

TROY, LINCOLN COUNTY, MONTANA.
Elevation, 1,880 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.57	.....
1895	2.59	0.74	0.42	1.31	2.53	0.60	1.73	0.23	2.46	0.59	1.52	2.20	16.92
1896	4.04	2.53	0.85	1.45	1.77	0.62	T	0.79	1.39	0.98	7.06	3.49	24.97
1897	0.90	1.85	2.73	0.68	0.52	4.30	1.48	0.14	2.51	1.42	9.34	3.44	29.31
1898	0.70	3.25	1.75	1.40	2.13	1.56	1.00	1.06	1.56	1.74	1.20	1.35	18.70
1899	3.95	1.43	1.44	2.22	2.31	1.26	0.37	2.30	2.34	1.96	2.84	2.57	24.99
1900	2.23	1.05	3.02	0.90	2.90	3.90	0.67	1.23	2.26	3.38	2.60	3.02	27.25
1901	2.84	1.31	1.08	1.97	2.04	3.38	0.53	0.59	2.76	1.06	3.36	1.01	22.83
1902	2.17	2.69	1.28	1.72	3.64	0.62	5.44	0.61	1.51	0.63	5.91	5.81	32.03
1903	4.50	1.09	3.49	1.02	0.80	2.00	1.61	0.85	1.78	1.15	4.86	1.37	24.52
1904	2.86	3.64	4.51	0.52	1.45	0.60	1.16	0.39	0.29	0.97	3.86	2.86	23.11
1905	1.47	1.66	1.34	0.65	2.27	2.19	1.26	0.19	1.33	4.28	1.27	2.08	19.99
1906	3.40	2.10	0.60	0.61	1.88	1.94	0.10	2.30	0.71	2.05	4.13	2.52	22.34
1907	1.83	1.55	3.35	2.65	1.42	2.33	1.87	1.71	2.33	0.50	2.31	2.00	23.85
1908	3.10	2.10	0.60	0.10	2.49	2.38	1.18	0.68	1.05	4.40	3.05	1.96	23.09
1909	6.62	2.74	1.15	0.60	1.08	1.38	2.69	0.32	1.60	2.25	8.39	1.47	30.29
Mns.	2.88	1.98	1.84	1.19	1.95	1.94	1.41	0.89	1.73	1.82	4.11	2.48	24.22

HAMILTON, COMBINED WITH GRANTSVILLE AND CORVALLIS, RAVALLI COUNTY, MONTANA.
Elevation, 3,575 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1895	.....	.....	.....	.....	.....	.....	0.80	0.12	0.84	0.02	0.16	.....	.....
1898	.....	.....	.....	.....	.....	.....	.....	.....	0.34	0.40	0.18	0.02	.....
1899	0.70	1.61	0.57	0.09	0.14	0.04	0.02	0.12	0.08	1.25	0.14	0.50	5.26
1900	0.00	0.45	0.35	1.45	2.30	1.45	0.50	1.30	0.90	0.30	0.70	0.05	9.75
1901	0.90	0.63	0.05	0.65	3.70	1.12	0.00	0.00	2.00	2.00	.....	.....	.....
1902	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.08	1.41	.....
1903	1.08	0.06	0.45	0.67	0.70	1.41	0.87	0.72	0.96	1.00	0.63	0.22	8.77
1904	0.07	0.41	1.26	0.68	1.31	0.67	0.18	0.24	0.26	1.29	0.40	0.97	7.74
1905	0.17	0.30	0.51	1.21	0.84	2.37	0.38	0.27	0.43	0.33	0.53	0.35	3.69
1906	0.99	0.66	0.99	1.00	2.73	1.24	0.50	1.45	1.04	0.72	1.60	1.50	14.42
1907	1.51	0.93	1.02	0.44	0.46	4.35	0.62	1.51	1.07	0.37	0.40	0.79	13.68
1908	0.43	0.16	0.93	0.90	3.83	2.62	0.88	1.10	1.43	1.10	0.07	0.03	13.48
1909	3.69	0.41	1.01	1.50	0.84	1.85	2.45	0.17	1.99	0.48	1.86	0.33	16.58
Mons. ..	0.95	0.56	0.72	0.86	1.68	1.71	0.65	0.64	0.94	0.77	0.65	0.58	10.71

PHILIPSBURG, GRANITE COUNTY, MONTANA.
Elevation, 5,275 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1903	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.65	2.68	0.69	.....
1904	0.23	1.27	1.58	0.90	1.10	0.98	0.26	0.25	T	0.53	0.01	0.18	7.29
1905	0.06	0.06	2.38	0.61	3.02	4.05	1.26	0.20	0.89	0.74	0.96	0.20	14.43
1906	0.27	0.49	0.80	2.25	2.65	2.30	0.32	1.65	1.83	0.84	1.05	1.22	15.67
1907	1.13	1.00	0.91	0.90	0.84	4.81	2.32	1.63	1.15	0.62	0.10	0.17	15.58
1908	0.52	0.63	0.61	1.04	7.11	4.06	0.78	0.41	2.69	1.57	0.15	0.40	19.97
1909	2.14	0.20	1.74	1.17	2.53	1.69	3.21	0.60	2.90	0.55	1.33	0.39	18.45
Mns.	0.72	0.61	1.34	1.14	2.88	2.98	1.36	0.79	1.58	0.79	0.90	0.46	14.55

KALISPELL, FLATHEAD COUNTY, MONTANA.
Elevation, 2,965 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1896	.....	.....	.....	.....	.....	0.34	0.73	0.18	3.15	.....	.....	0.54	.....
1897	0.76	1.33	0.34	0.77	0.34	3.16	1.91	0.11	2.27	0.57	5.17	0.26	16.99
1898	0.60	0.32	3.12	0.51	1.41	1.13	1.15	1.10	0.55	1.24	1.04	0.33	12.50
1899	3.35	1.30	0.25	0.78	2.11	1.94	1.10	2.08	2.75	1.13	0.96	1.75	19.50
1900	0.84	0.99	0.56	1.33	3.90	1.40	0.75	1.48	3.02	0.76	1.87	0.88	17.78
1901	1.26	0.84	0.98	0.45	1.95	2.85	0.34	0.14	1.81	0.43	0.73	1.06	12.85
1902	0.77	1.67	0.46	0.58	4.50	1.51	2.65	0.95	0.76	0.16	2.95	2.24	19.21
1903	0.91	0.48	0.53	0.95	1.07	1.61	1.70	0.78	1.49	1.11	3.13	0.87	14.63
1904	1.12	1.90	1.94	0.70	0.79	0.60	0.78	1.15	0.40	0.43	0.26	0.82	10.89
1905	1.33	1.21	0.76	0.73	2.73	2.72	0.56	0.11	1.21	1.81	1.54	0.49	15.20
1906	1.14	0.41	0.72	0.46	2.68	1.03	0.22	1.98	0.23	0.75	1.79	2.09	13.50
1907	2.01	1.51	1.16	0.87	1.06	3.01	1.14	2.54	2.12	T.	0.50	1.02	16.94
1908	1.70	0.81	1.92	0.71	4.21	2.48	1.44	0.88	2.01	1.53	0.35	0.47	18.51
1909	1.80	1.11	0.72	0.83	1.47	3.05	3.07	0.11	1.21	0.43	2.99	1.01	17.80
Mns.	1.35	1.07	1.04	0.74	2.17	1.92	1.25	0.97	1.64	0.80	1.79	0.99	15.73

PLAINS, SANDERS COUNTY, MONTANA.
Elevation, 2,475 Feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1898	.....	.....	.....	.....	.....	.....	.....	.....	0.30	0.60	1.16	0.10	.....
1899	1.40	0.10	0.75	0.30	2.00	0.10	0.09	0.07	1.48	0.60	0.80	0.90	8.59
1900	0.40	0.80	0.20	1.25	4.00	2.20	0.60	2.27	2.30	0.86	1.28	0.50	16.66
1901	1.10	0.70	0.65	0.30	0.60	1.21	0.15	0.25	1.92	0.54	0.80	1.90	10.12
1902	0.35	1.10	0.10	0.55	3.47	1.03	4.74	0.78	0.57	0.15	2.60	2.40	17.84
1903	0.35	0.10	0.50	1.30	0.80	2.12	1.42	1.68	1.77	1.17	2.64	0.30	14.15
1904	0.80	1.70	1.35	T	0.30	0.15	0.98	1.03	T	0.56	T	0.20	7.07
1905	0.35	0.20	0.75	0.35	1.48	3.57	0.88	T	1.60	1.65	1.03	0.30	12.16
1906	0.60	0.50	0.50	0.40	4.52	1.36	0.75	2.37	0.05	1.51	2.39	0.95	15.90
1907	1.80	0.45	0.43	0.60	0.08	2.09	2.69	1.05	1.18	T	0.15	0.30	10.73
1908	0.70	0.50	0.55	0.38	3.51	3.40	1.05	0.23	2.77	1.54	0.25	0.20	15.08
1909	3.50	0.20	0.40	0.80	0.15	2.35	4.40	T	2.16	T	2.87	T	16.83
Mns.	1.03	0.58	0.56	0.57	1.90	1.77	1.61	0.88	1.34	0.76	1.33	0.67	13.00

AVERAGE NUMBER OF DAYS WITH .01 INCH OR MORE OF PRECIPITATION.

Stations.	Length of Record, Yrs.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Anaconda	6	5	5	6	5	9	8	7	5	6	4	5	6	71
Columbia Falls	11	9	7	6	5	10	11	6	6	7	5	9	8	89
Dayton	6	10	7	8	6	12	11	7	5	6	6	6	8	92
East Anaconda	4	8	5	7	6	12	11	9	6	7	5	5	5	86
Fortine	3	13	11	11	12	16	12	8	6	10	9	12	14	134
Hamilton	7	7	4	7	5	9	9	5	4	6	4	5	5	70
Kalispell	10	14	12	10	8	13	12	7	7	8	7	11	12	121
Missoula	24	7	5	7	6	8	8	5	4	6	5	8	6	75
Ovando	10	11	9	9	7	12	11	5	5	7	7	8	12	103
Philipsburg	6	5	4	7	6	12	11	8	4	5	5	5	4	76
Plains	11	4	3	3	3	6	4	4	3	4	3	5	2	44
Saltese	5	11	10	8	4	5	6	3	2	4	4	9	9	75
Snowshoe	3	25	17	18	16	14	13	8	9	9	9	17	10	165
Troy	11	11	11	10	7	10	9	6	5	7	9	13	11	100

MEAN TEMPERATURE.

Stations.	Length of Record, Yrs.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Anaconda	8	23.4	27.0	31.0	40.6	48.0	54.3	63.3	62.1	55.6	46.4	33.4	26.1	42.6
Columbia Falls	14	22.5	24.7	32.5	42.9	51.0	56.8	63.9	62.4	53.3	43.5	32.6	25.6	42.6
Dayton	6	22.5	26.8	33.8	43.6	50.5	58.1	65.3	64.8	57.1	44.6	34.4	27.6	44 1
Deer Lodge	14	21.6	24.0	29.4	40.6	49.2	58.0	62.9	60.3	51.7	45.2	28.9	20.5	41.0
East Anaconda	4	21.7	28.2	28.1	39.0	44.7	52.8	64.1	61.7	55.2	34.7	32.7	25.0	41.4
Fortine	4	13.8	26.5	32.1	39.7	48.7	55.2	61.4	57.4	52.4	42.6	32.6	22.4	40.4
Hamilton	6	26.3	30.9	36.6	46.8	52.6	58.2	65.5	65.3	57.0	45.7	36.6	28.0	45.8
Kalispell	11	19.6	23.8	33.0	42.5	51.0	58.8	64.3	62.9	53.9	42.5	32.0	23.9	42.4
Missoula	30	21.1	24.5	34.5	44.8	53.7	59.8	67.1	62.9	55.8	44.9	32.2	24.5	43.8
Ovando	10	15.3	19.5	28.7	39.4	47.7	53.6	60.6	58.7	50.6	41.2	30.1	21.4	38.0
Philipsburg	6	21.8	26.6	30.4	40.9	46.5	53.5	61.8	60.4	54.0	44.5	33.8	26.6	41.7
Plains	11	25.7	27.7	36.1	44.6	51.7	57.5	65.8	64.1	56.0	46.5	32.1	28.2	44.7
Pleasant Valley	2	18.4	23.7	29.6	38.9	47.4	54.8	60.1	54.7	51.0	42.0	33.2	21.0	39.6
Polson	2	20.2	28.7	34.4	41.5	50.8	58.8	64.2	65.4	58.6	48.5	35.5	28.4	44.6
St. Ignatius	3	24.6	28.6	33.6	45.2	50.8	59.4	63.1	65.0	55.2	44.3	35.4	25.7	44.2
Snowshoe	3	18.0	26.4	29.4	35.9	44.4	52.5	60.4	57.0	51.5	42.4	31.8	20.0	39.1
Troy	15	25.2	29.5	35.8	46.1	53.6	58.8	64.2	63.0	55.0	46.2	35.7	28.6	45.1

MEAN RELATIVE HUMIDITY.

Station.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Kalispell	6 a. m.	86	86	81	78	82	82	78	77	82	86	86	87	83
	6 p. m.	80	73	58	42	49	47	37	36	50	62	76	83	58

AVERAGE SNOWFALL.

Stations.	Length of Record, Yrs.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Anaconda	5	6.5	5.2	8.1	6.0	2.2	0.1	0.0	0.0	0.8	0.3	3.0	8.4	40.6
Columbia Falls	10	13.0	9.2	6.2	2.0	0.9	0.2	T.	T.	T.	0.4	9.2	9.8	50.9
Dayton	6	11.7	8.4	5.4	0.8	T.	0.0	0.0	0.0	0.0	0.6	4.3	7.0	38.2
East Anaconda	4	13.1	8.2	8.1	4.4	2.4	0.8	0.0	0.0	0.2	0.6	5.1	7.4	50.3
Fortine	3	16.0	8.6	10.6	5.0	T.	0.0	0.0	0.0	0.1	0.1	3.2	13.8	57.4
Hamilton	7	13.3	6.5	8.2	1.4	0.1	T.	0.0	0.0	T.	T.	3.9	4.4	37.8
Kalispell	10	10.3	8.4	5.5	1.5	0.1	T.	0.0	0.0	T.	0.6	7.6	8.1	42.1
Missoula	23	2.2	5.7	4.9	1.4	T.	T.	0.0	0.0	0.0	0.5	3.0	6.3	24.0
Ovando	9	17.0	14.6	8.6	4.2	1.1	0.2	0.0	0.0	T.	2.3	7.7	14.1	69.8
Philipsburg	6	8.5	6.4	8.6	4.7	2.7	0.3	0.0	0.0	0.4	2.4	4.2	4.0	42.2
Plains	11	8.7	5.3	3.8	1.6	T.	0.0	0.0	0.0	0.0	0.0	3.8	5.4	28.6
Saltese	5	40.1	29.0	20.4	8.5	2.5	0.0	0.0	0.0	0.2	0.0	9.6	32.0	142.3
Snowshoe	3	54.0	46.5	44.5	27.7	2.6	0.0	0.0	0.0	4.2	5.4	31.2	54.8	270.9
Troy	11	14.4	15.0	7.2	1.3	T.	T.	0.0	0.0	0.0	T.	8.7	9.7	56.3

PREVAILING WIND DIRECTION.

Stations.	Lenth of Record, Yrs.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Columbia Falls	10	s	s	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw
East Anaconda	4	w	w	w	w	w	ne	w	w	w	w	w	w	w
Fortine	3	nw	sw	sw	sw	w	sw	sw	sw	sw	w	w	s	sw
Hamilton	7	sw	w	s	w	w	w	w	w	w	w	w	w	w
Kalispell	10	w	w	w	w	w	w	w	w	w	w	w	w	w
Missoula	24	w	sw	w	w	w	w	w	w	w	w	nw	w	w
Ovando	10	w	w	w	w	w	w	w	w	w	w	w	w	w
Philipsburg	6	s	s	sw	s	s	sw	sw	sw	sw	sw	sw	sw	sw
Plains	11	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw
Saltese	5	w	w	w	w	w	w	w	w	w	w	w	w	w
Snowshoe	3	sw	w	w	sw	w	w	w	w	w	w	w	w	w
Troy	11	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw

FROST DATA.

Stations.	Length of Record, Years.	Average Date of First Killing Frost in Autumn.	Average Date of Last Killing Frost in Spring.	Earliest Date of Killing Frost in Autumn.	Latest Date of Killing Frost in Spring.
Anaconda	8	September 4	June 13	August 14	July 8
Columbia Falls	16	August 22	June 9	July 19	July 15
Dayton	6	September 15	May 17	August 18	June 19
Deer Lodge	8	September 6	June 16	August 21	July 7
East Anaconda	4	September 14	June 1	August 14	June 20
Fortine	3	August 6	May 31	July 26	June 15
Hamilton	7	September 24	May 12	September 14	May 25
Kalispell	12	September 30	May 13	September 6	June 18
Missoula	10	September 19	May 13	August 1	June 30
Ovando	10	August 12	July 4	July 29	July 30
Philipsburg	6	August 15	June 11	July 4	July 6
Plains	10	September 19	May 29	September 6	June 24
Pleasant Valley	2	August 4	July 10	July 28	July 21
Polson	2	October 14	May 10	October 8	May 14
St. Ignatius	4	September 10	May 23	September 2	June 7
Snowshoe	3	September 9	May 21	August 27	May 25
Troy	13	September 7	June 1	July 30	June 25

Hydrographic Data for Section 28.

Preliminary Note:—Only the broader facts concerning the rivers are here given. Information in more detail can be procured on application to the Director, United States Geological Survey, Washington, D. C.

This section comprises the headwaters of the Columbia River in the westerly part of Montana. Clark Fork rise on the eastern slopes of the high mountain ranges that form the boundary between Montana and Idaho. It flows northward, northwestward, and again northward as it crosses western Montana, flowing thence into Lake Pend Oreille.

Bitter River, tributary to Clark Fork at Missoula, has its source in the high mountains forming the boundary line between Montana and Idaho. The main stream flows in a northerly direction, the streams tributary to it on the east draining the comparatively low hills, contributing but little to the supply of the river. The branches on the west, on the contrary, are numerous and drain precipitous and heavily-wooded areas. Their discharges are regulated by many small lakes, fed by banks of snow

which remain unmelted far into the summer. From Hamilton to Missoula, Montana, a distance of 48 miles, the fall of the river is 350 feet, or 7 3-10 feet per mile.

Flathead River, which joins Clark Fork at Paradise Mountain, has its headwaters on the western slopes of the Great Divide of the Rocky Mountains. The headwaters of the North Fork of Flathead River lie in British Columbia. Thence the stream flows in a southerly direction to join the South Fork of Flathead River, which flows in a northerly direction, a short distance above Columbia Falls. Thence the main Flathead River flows southward through Flathead Lake to Dixon, Montana, and thence through a right angle westerly to Clark Fork.

Flathead Lake occupies the lowest portion of an extensive valley which extends from the Jocko Mountains on the south, northward across the international boundary between the United States and British Columbia, a distance of over 100 miles. The lake proper is about 35 miles long and 15 miles wide. The plains at the southern end of the lake are about 36 miles long and from five to eight miles wide, nearly level and very fertile. At the northern end of the lake the valley is from four to eight miles wide and 50 miles long, level and fertile, abundantly watered by rainfall and becoming one of the most valuable valleys in the northwest. From Kalispell, Flathead River pursues its circuitous course through the valley bottom with a barely perceivable current. Its total length is about 25 miles, but measured in a straight line, it is only 15 miles. Its width varies from 300 to 600 feet, its depth is nowhere less than 20 feet and some places measure as much as 75 feet. It is navigable throughout its entire length. It is more properly an arm of Flathead Lake than a river, since its level is that of the lake, except for a slight difference necessary to produce flow. The river is simply a remnant of the old lake, as is plainly shown by the slight elevation of the banks above the water and by the fact that the surrounding valley bottom is but a few feet above the level of the river.

The following table shows in a general way the stream flow which can be expected to prevail for a given month of an average year. Opposite each month is given: First, the maximum flow for a 24-hour period which has been observed during the period covered by the table; second, the minimum flow for a 24-hour period which has been observed during the period covered by the table; and third, the mean flow for that month for the entire period covered by the table. The remaining columns are computed from the third column of mean monthly discharge. Column 4 gives the mean flow for the entire period in cubic feet per second per square mile on the assumption of a uniform rate of discharge from each square mile of drainage area. Column 5 gives the depth in inches to which the entire drainage area would be covered in an average month if all the water flowing from it during that month were conserved and uniformly spread over the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches. And similarly in column 6, the discharge in acre feet indicates the number of

acres of land which would be covered to a depth of one foot, if the total run-off during the month were spread uniformly over the area.

MONTHLY DISCHARGE OF CLARK FORK* RIVER, MISSOULA, MONTANA.

For Period March 1 to November 30, 1902; January 1, 1903, to December 31, 1904; March 1 to December 31, 1905; March 1, 1906, to June 30, 1907.

Drainage area, 5,960 square miles.

Month.	Discharge in Second Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square Mile.	Depth in Inches on Drainage Area.	Total in Acre Feet.
January	.....	.....	1,630	.273	.31	100,000
February	1,500†	810†	1,570	.263	.27	87,200
March	7,750	810	1,860	.312	.36	114,000
April	8,980	1,240	3,760	.631	.70	224,000
May	18,400	2,790	7,490	1.260	1.45	461,000
June	21,900	3,090	9,600	1.610	1.80	571,000
July	6,980	1,380	3,150	.529	.61	194,000
August	2,640	870	1,580	.265	.31	97,200
September	1,860	748	1,340	.225	.25	79,700
October	1,980	908	1,390	.233	.27	85,500
November	4,900	1,010‡	1,750	.294	.33	104,000
December	2,120	1,620	1,540	.258	.30	94,700
The Period	21,900	.....	3,050	.513	6.96	2,210,000

MONTHLY DISCHARGE OF CLARK FORK RIVER, PRIEST RIVER, IDAHO.

For Period July 1, 1903, to April 30, 1905.

January	14,800	5,700	10,500	.....	.....	646,000
February	11,700	5,860	9,160	.....	.....	509,000
March	15,400	8,290	11,800	.....	.....	726,000
April	58,300	11,400	22,000	.....	.....	1,310,000
May	92,000	60,000	74,500	.....	.....	4,580,000
June	93,000	70,100	85,000	.....	.....	5,060,000
July	114,000	32,200	61,900	.....	.....	3,810,000
August	43,900	14,300	25,200	.....	.....	1,550,000
September	19,000	9,900	13,900	.....	.....	827,000
October	16,600	8,510	12,300	.....	.....	756,000
November	18,100	7,960	12,300	.....	.....	732,000
December	17,200	7,830	12,300	.....	.....	756,000
The Period	114,000	5,700	29,200	.....	.....	21,300,000

MONTHLY DISCHARGE OF FLATHEAD RIVER, POLSON, MONTANA.

For Period August 1, 1907, to December 31, 1908.

January	.....	.....	2,540	.....	.....	156,000
February	2,440	2,280	2,420	.....	.....	134,000
March	2,910	2,280	2,460	.....	.....	151,000
April	18,400	2,530	7,040	.....	.....	419,000
May	33,600	18,700	29,000	.....	.....	1,780,000
June	62,100	32,700	48,800	.....	.....	2,900,000
July	33,600	14,500	27,100	.....	.....	1,670,000
August	20,700	5,230	11,700	.....	.....	719,000
September	9,330	4,300	6,620	.....	.....	394,000
October	6,850	3,880	4,800	.....	.....	295,000
November	4,160	3,130	3,840	.....	.....	228,000
December	4,020	.....	3,240	.....	.....	199,000
The Period	62,100	.....	12,500	.....	.....	9,040,000

*Formerly called Missoula River. †Feb. 20–28, 1906. ‡Nov. 1–23, 1905.

Section 29.—NORTH-CENTRAL MONTANA.

This district lies in the north-central portion of Montana, between the 47th and 49th parallels of north latitude, and extends from the 109th meridian on the east to the crest of the main range of the Rocky Mountains on the west. It comprises an area of nearly 25,000 square miles, and the population exclusive of the three principal cities, Great Falls, Havre and Fort Benton, is probably less than 15,000.

It has an exceedingly varied topography, comprising extensive areas of comparatively level prairie, with an elevation above sea level ranging from 3,000 to 4,000 feet; rolling bench or table lands, mostly above 4,000 feet elevation; a considerable percentage of rough foot-hill country, and high rugged mountains on the southern and western borders. The most typically mountainous section is in the main range, but the southern boundary line passes through the northern end of the Little Belt and Baldy ranges. In addition to these there are three groups of mountains, the winter snows of which afford an unfailing water supply to numerous small streams. These are the Highwood Mountains in the southeastern portion, with elevations above 7,000 feet; the Bear Paws in the extreme eastern portion, which have about the same elevation; and the Sweet Grass Hills, near the Canadian line, with some peaks above 8,000 feet elevation.

The Missouri River flows in a northeasterly course across the southeastern corner of the Section for a distance of more than 100 miles, and several important sub-drainage basins are wholly or partly within the area under discussion. The Milk River rises on the eastern slope of the main range, near the Canadian line, flows northeastward into Canada, reenters the State again, and crosses the northeast corner of the Section. The Marias, St. Mary's, Teton, and Sun River basins are wholly within this district, and form the drainage systems of the northwestern two-thirds of the territory. The Judith River flows from the south, and drains the rich agricultural valley known as the Judith Basin.

Extensive irrigation projects are in course of construction in most of these watersheds, and the total area to be reclaimed is considerably in excess of half a million acres. The most important of these projects, with the approximate amount of land to be reclaimed, are the following, under the supervision of the U. S. Reclamation Service: Sun River, 276,000 acres; Blackfeet, 132,000 acres; St. Mary's, 100,000 acres. There are also extensive irrigation systems being built by private corporations, and under the Carey Land Act.

There are large areas of fertile bench lands, that are not susceptible of irrigation, which are well adapted to cultivation under the system known as dry farming. These are rapidly being taken up under the enlarged homestead law, which provides for free homesteads of 320 acres of this class of land.

With the exception of small areas adjacent to the railroads and large towns, this is undeveloped country. The soil is for the most part fertile, and capable of producing large yields of wheat, oats, flax, barley and

rye, besides various kinds of forage crops, and potatoes, sugar beets, and numerous other vegetable crops. Stock raisingg has heretofore been the principal industry, but during the last two or three years this has been largely supplanted by diversified farming, which promises an even more rapid development in the future.

The are vast power possibilities lying dormant in the streams of this section, the most notable instance being the series of waterfalls in the Missouri River near the City of Great Falls, where there has already been developed nearly 40,000 horsepower. The total efficiency of the natural fall of the river in this vicinity is estimated at more than 100,000 horsepower.

The forests are confined principally to the higher mountain districts. There is a narrow area parallel to the summit of the main range of the Rockies with an abundant growth of timber, and forests of less extent are found in the higher districts of the Little Belt, Baldy, and Highwood mountains.

Climatic Characteristics.

The climate of this portion of Montana differs in some material respects from that of Section No. 30, in the same latitude to the eastward, and also from the northern part of Section No. 28, in the same latitude west of the continental divide. It is on the whole somewhat colder and drier than the latter, and somewhat more moist and farther removed from the path of the cold waves moving from the Canadian Northwest than the former. The annual mean temperature ranges from about 37° to 46°. The warmest section is in Cascade and southwestern Chouteau counties, and the coldest is near the Canadian border. The seasonal average temperatures for the Section are as follows: Winter, 63°; spring, 40°; summer, 62°; autumn, 44°. The coldest month is January, and the warmest is July. The winter minimum occassionally falls to 40° below zero, or lower, in most localities, but such temperatures are rather exceptional, and the average winter month has one or more extended periods of mild weather, chinook conditions being somewhat more pronounced here than in most other parts of the State. Maximum temperatures of 100°, or above, have been recorded in most localities in July and August, and at several stations in June and September.

In the agricultural sections there are usually over three months without injurious frosts, and for the staple crops such as the cereals and grasses, the period is much longer.

The precipitation is sufficient over practically this entire district for successful dry farming, except where the soil may be poorly adapted to the conservation of moisture. The average annual precipitation for the Section is about 17 1-3 inches, except over a small area extending from northern Cascade northeastward across Chouteau County, where it is less than 14 inches. In some localities near the mountains it is above 20 inches. The distribution throughout the year is especially favorable for agriculture, since more than half of the annual amount falls during the four principal growing months, April to July, inclusive.

Being a comparatively level country, except in the southern and western portions, this section is more subject to high winds than those to the southward and westward. The average hourly wind velocity at Havre, in the northeast portion is 10 miles. The prevailing winds are from the southwest over somewhat more than half the Section, and from the west over the remainder.

The average number of days with a measurable amount of precipitation is 71. The average snowfall is 58 inches.

R. F. YOUNG, Section Director.

PRECIPITATION IN NORTH-CENTRAL MONTANA. MONTHLY, ANNUAL AND AVERAGE AMOUNTS (IN INCHES AND HUNDREDTHS).

AUGUSTA, LEWIS AND CLARK COUNTY, MONTANA.

Elevation, 4,071 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1896	.....	.....	.....	.....	.....	.....	1.60	1.78	2.62	0.30	1.30	0.10	.....
1897	0.57	1.00	0.30	1.11	0.86	4.77	2.07	.....	.....	.....	.....	0.42	.....
1898	0.36	0.07	2.28	1.45	.....	.....	.....	.....	.....	.....	.....	.....	.....
1901	0.42	0.12	0.26	0.51	4.13	3.57	0.38	0.07	4.30	0.07	0.09	0.65	14.57
1902	0.14	0.49	0.76	0.35	4.16	0.79	2.50	0.77	0.36	T.	0.32	1.00	11.64
1903	0.19	0.18	1.00	1.71	2.48	1.36	3.54	1.51	0.75	0.27	1.71	0.69	15.39
1904	0.21	0.15	2.18	0.50	0.92	0.99	1.20	0.32	0.16	0.10	T.	0.40	7.13
1905	0.40	0.40	2.27	1.78	1.52	4.97	1.70	1.44	0.07	0.47	0.60	0.10	15.72
1906	0.51	0.45	0.70	0.92	6.43	0.97	1.00	2.18	0.51	0.41	0.60	1.50	16.18
1907	2.10	0.40	1.05	2.08	2.62	6.35	2.12	1.76	0.91	0.42	0.10	0.[illegible]	20.01
1908	0.85	0.90	3.92	0.37	6.33	5.26	0.80	1.57	2.20	0.94	T.	0.30	23.44
1909	1.90	0.20	0.67	1.80	2.53	5.64	5.51	0.09	3.70	0.18	0.65	0.59	23.46
M'n.	0.70	0.40	1.40	1.14	3.20	3.47	2.04	1.15	1.56	0.32	0.54	0.53	16.45

CHESTER, CHOUTEAU COUNTY, MONTANA.

Elevation, 3,140 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1900	.....	.....	.....	.....	.....	.....	0.50	1.70	0.16	0[illegible]02	0.39	T.	.....
1901	0.60	T.	0.10	0.15	2.42	1.80	0.01	0.03	1.11	0.01	0.07	0.60	6.90
1902	0.00	0.50	T.	.....	0.58	3.64	.....	.....	.....	.....	.....	.....	.....
1903	.....	.....	.....	.....	0.44	.....	.....	.....	.....	.....	.....	.....	.....
1904	.....	0.75	.....	0.01	0.16	0.09	0.11	0.03	0.00	0.05	0.00	0.85	.....
1905	1.01	0.00	0.05	0.17	.....	.....	.....	.....	.....	.....	.....	0.10	.....
1906	0.35	0.10	0.60	0.02	4.00	1.86	1.13	1.60	0.57	0.60	0.75	0.60	12.18
1907	1.50	0.50	0.40	2.06	1.60	6.36	0.77	1.77	0.93	0.00	0.02	0.05	15.96
1908	0.00	T.	2.17	0.25	1.92	4.44	0.90	1.30	1.21	0.35	0.00	0.02	12.56
1909	0.80	0.12	0.12	.....	2.23	3.46	1.54	.....	.....	.....	.....	.....	.....
M'n.	0.61	0.25	0.49	0.44	1.67	3.09	0.71	1.07	0.66	0.17	0.20	0.32	9.68

CHOTEAU, TETON COUNTY, MONTANA.

Elevation, 3 810 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1890	.....	.....	.....	.....	.....	.....	0.08	1.23	2.44	0.87	0.50	1.10	.....
1891	0.50	2.05	1.00	T.	2.30	3.07	4.98	1.10	0.15	0.16	0.70	0.70	16.71
1892	2.25	0.74	0.80	1.50	1.66	4.53	0.83	.....	.....	.....	.....	.....	.....
1893	1.50	0.60	0.40	0.95	1.74	0.58	0.41	0.17	1.93	1.45	2.10	1.00	12.83
1894	1.22	0.10	0.80	0.25	3.67	2.83	0.50	0.77	0.49	0.30	0.40	0.35	11.71
1895	1.61	1.85	1.05	0.24	0.42	3.06	1.04	0.39	0.75	0.30	1.40	1.05	13.16
1896	1.45	1.02	1.30	1.05	3.84	0.60	1.67	2.52	2.53	1.50	1.20	0.05	18.73
1897	0.60	1.50	1.30	0.93	1.05	7.24	1.20	0.20	0.98	0.32	2.00	0.70	18.02
1898	.....	0.50	3.60	1.06	3.75	.....	.....	.....	.....	.....	.....	.....	.....
1905	0.50	0.12	0.56	0.55	1.45	2.63	1.25	0.70	0.27	0.10	0.26	T.	8.39
1906	0.12	0.08	0.31	0.56	4.47	1.57	1.14	2.75	0.28	0.09	0.70	0.87	12.94
1907	.....	.....	.....	0.59	1.50	8.10	1.37	1.28	0.66	0.05	.....	.....	.....
1908	.....	.....	.....	.....	.....	.....	.....	.....	1.61	1.00	0.00	0.00	.....
1909	1.60	0.20	0.70	1.40	1.76	4.17	0.90	0.00	1.30	0.00	0.40	0.75	17.18
M'n.	1.14	0.80	1.07	0.76	2.30	3.33	1.61	1.01	1.12	0.51	0.88	0.60	15.18

FORT BENTON, CHOUTEAU COUNTY, MONTANA.

Elevation, 2,630 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1869	1.75	0.40	1.35	2.95	5.08	.....	.....	.....	.....	.....	0.26	0.76	.....
1870	1.00	0.42	0.15	0.06	2.41	0.63	0.80	0.71	0.32	0.41	0.14	0.22	7.27
1871	0.50	0.38	0.48	1.48	1.58	0.11	0.93	0.10	0.46	0.71	0.65	1.30	8.68
1872	0.27	0.34	0.82	0.67	0.64	1.14	4.62	0.61	1.82	0.19	0.61	0.59	12.32
1873	0.60	0.65	0.23	1.14	3.03	1.67	1.29	1.59	0.58	0.19	0.86	0.12	11.95
1874	0.67	0.10	0.64	0.43	2.98	2.13	0.10	1.17	0.49	0.56	0.58	0.60	10.45
1875	0.66	1.11	0.22	1.04	1.60	2.57	2.24	1.19	0.13	0.71	0.85	0.43	12.75
1876	0.71	0.28	1.53	1.25	11.06	1.45	2.31	1.46	0.39	0.24	0.33	0.09	21.10
1877	0.72	0.11	0.60	1.04	4.58	1.44	1.94	0.80	0.90	0.43	0.45	0.00	13.01
1878	0.20	0.05	0.30	3.24	5.25	2.26	1.31	0.16	2.32	1.18	0.09	0.50	16.86
1879	0.22	0.74	0.14	1.36	4.08	4.98	1.98	1.56	0.18	0.60	0.06	1.40	17.30
1880	0.24	0.64	0.36	1.80	1.54	4.50	1.12	1.56	0.32	1.09	1.44	1.39	16.00
1881	2.27	0.66	0.29	0.18	1.43	3.46	2.28	1.18	1.32	1.94	1.73	0.07	16.81
1882	0.75	0.38	1.09	1.22	0.35	0.13	0.85	0.27	2.89	0.86	0.39	1.00	10.18
1883	0.75	0.45	1.34	1.02	3.31	1.93	0.16	1.01	0.93	1.64	0.36	0.11	13.01
1884	0.56	9.48	0.61	1.23	1.09	2.18	3.09	0.79	1.44	0.36	0.29	1.01	13.13
1885	0.94	0.60	0.40	0.64	0.48	5.60	2.82	1.81	0.25	0.37	0.65	0.38	14.94
1886	0.67	0.65	0.70	2.01	0.36	1.53	0.90	0.66	1.24	.....	.....	.....	.....
1895	.....	.....	0.40	1.60	1.14	2.03	2.56	0.20	0.59	0.04	0.70	0.19	.....
1896	0.80	T.	0.16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1897	.....	.....	0.30	1.15	1.14	4.51	2.36	0.00	0.61	0.86	1.10	0.80	.....
1898	0.10	T.	1.40	0.96	3.25	4.87	0.80	0.30	1.32	.....	0.43	0.40	.....
1899	0.60	.....	.....	1.30	3.90	3.40	1.30	0.76	1.26	0.70	T	1.60	.....
1900	T	0.30	.....	.....	0.90	0.62	0.83	0.55	.....	.....	.....	.....	.....
1901	0.80	0.80	0.40	0.67	4.34	1.38	0.95	0.20	1.68	0.10	1.45	.....	.....
1902	0.40	0.60	T	0.22	.....	.....	1.22	0.27	0.13	0.04	0.10	0.90	.....
1903	0.10	0.70	0.80	0.65	3.23	1.43	3.70	0.91	0.65	0.28	0.40	0.30	13.15
1904	.....	0.70	1.00	0.64	1.96	1.36	0.58	0.83	1.15	0.09	.....	.....	.....
1905	.....	.....	0.40	0.94	0.91	1.90	1.42	0.95	0.32	0.61	0.50	0.60	.....
1906	0.40	0.43	0.50	0.85	4.02	1.75	0.50	1.40	0.90	0.83	0.82	0.80	13.20
1907	2.40	0.60	0.70	1.60	1.39	6.15	2.75	2.05	1.05	0.00	T	0.00	18.69
1908	0.55	0.50	0.80	1.20	4.08	2.30	0.00	1.60	1.90	1.78	0.00	T	14.71
1909	1.30	0.00	0.50	1.90	2.54	5.50	3.86	0.35	1.75	0.35	0.70	0.65	19.40
M'n.	0.72	0.45	0.60	1.17	2.70	2.50	1.65	0.87	0.98	0.61	0.55	0.58	13.38

GREAT FALLS, CASCADE COUNTY, MONTANA.

Elevation, 3,350 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.23	.....
1892	0.68	0.41	0.60	1.89	0.29	6.93	3.02	0.76	0.08	0.03	1.45	1.20	17.34
1893	1.61	0.39	0.50	0.82	3.49	1.99	0.52	0.11	1.92	0.90	1.33	0.38	13.96
1894	1.61	0.39	1.05	0.76	2.76	2.62	0.45	0.17	0.52	0.38	0.14	0.74	10.64
1895	0.74	0.53	0.11	1.00	0.21	2.24	0.46	0.20	0.02	0.10	0.59	0.23	6.73
1896	0.55	0.16	1.39	1.29	3.29	1.14	0.65	0.27	2.06	0.03	1.54	0.15	12.52
1897	0.31	1.22	1.05	1.04	0.95	5.89	3.24	0.07	1.04	0.67	1.55	0.37	17.40
1898	0.28	0.20	1.14	1.24	3.22	2.93	2.30	1.29	1.72	1.01	0.57	0.37	16.27
1899	1.10	0.35	0.47	1.41	3.12	0.88	1.70	1.10	0.76	0.91	0.20	0.80	12.80
1900	0.02	0.77	0.53	1.39	2.73	0.64	0.46	1.53	1.17	0.80	1.44	0.20	11.68
1901	0.74	0.55	0.33	0.97	3.48	2.63	1.39	0.12	1.89	0.03	0.02	0.53	12.66
1902	0.16	1.02	0.19	0.05	5.93	4.02	2.14	0.55	0.74	0.07	0.45	0.39	15.71
1903	0.08	0.35	0.89	2.00	1.84	2.19	2.74	0.74	0.99	0.45	0.83	0.91	14.01
1904	0.17	0.51	0.65	0.62	1.36	1.06	0.97	0.57	0.14	0.44	0.01	0.38	6.88
1905	0.32	0.17	0.66	0.68	1.99	4.23	0.67	0.82	0.18	0.26	1.25	0.18	11.41
1906	0.32	0.77	0.73	1.17	5.03	5.59	0.88	2.66	0.63	1.07	1.97	1.45	22.27
1907	1.78	0.26	0.95	0.90	1.74	7.46	2.09	2.67	0.25	0.10	T	0.52	18.72
1908	0.77	0.62	2.27	0.47	4.62	4.22	0.43	3.13	2.58	2.51	0.11	0.16	21.89
1909	1.29	0.42	1.49	1.86	1.73	5.77	5.45	0.61	2.85	0.48	1.03	0.75	23.73
Means ...	0.65	0.49	0.83	1.09	2.65	3.47	1.66	0.96	1.09	0.57	0.80	0.52	14.77

HAVRE, CHOUTEAU COUNTY, MONTANA, COMBINED WITH FORT ASSINIBOINE.

Elevation, 2.505 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1880	0.10	0.30	0.18	1.29	0.79	2.44	1.72	2.56	0.37	0.22	0.60	1.61	12.18
1881	2.29	0.70	0.38	0.20	0.90	3.10	3.45	1.45	1.64	0.75	0.60	0.08	15.54
1882	0.20	0.24	0.55	2.68	1.35	1.06	1.37	0.73	2.19	0.87	0.16	1.36	12.76
1883	2.47	0.72	1.61	0.43	0.65	0.77	0.24	2.59	0.65	0.98	3.76	0.23	15.10
1884	0.16	0.44	0.53	0.25	3.05	4.72	9.67	2.61	2.69	0.41	0.42	0.72	25.67
1885	0.83	0.78	0.13	0.38	0.43	2.01	1.56	1.45	0.17	0.06	0.16	0.41	8.37
1886	1.50	0.77	0.85	1.83	0.99	1.38	0.47	0.35	1.47	0.51	0.74	0.62	11.48
1887	1.17	0.05	0.07	1.64	0.72	9.33	1.16	2.56	1.14	0.18	0.29	0.63	18.94
1888	0.46	1.47	0.95	0.50	2.04	4.49	0.51	2.16	0.41	0.34	0.06	0.60	13.99
1889	0.26	0.45	0.81	0.31	3.15	0.24	3.22	0.10	0.57	T	0.26	0.38	9.75
1890	0.46	0.68	0.11	0.08	0.78	2.05	0.58	1.26	1.87	1.47	0.17	0.25	9.76
1891	0.06	0.11	0.15	1.01	3.79	3.92	4.68	1.67	0.87	0.59	0.15	0.08	17.08
1892	0.19	0.33	0.28	1.04	0.86	3.79	1.87	1.09	0.44	0.25	1.08	1.18	12.40
1893	1.23	0.34	0.42	1.14	1.80	1.20	1.77	1.16	1.67	1.40	0.80	0.38	13.31
1894	0.99	0.14	0.64	2.23	2.33	2.83	0.38	0.48	1.70	1.73	0.57	0.47	14.49
1895	1.06	0.91	0.34	0.62	0.43	3.36	2.24	0.04	1.05	0.12	0.47	0.30	10.94
1896	1.38	0.52	0.67	1.09	4.27	3.02	0.66	0.65	1.63	0.68	1.80	0.11	16.48
1897	0.53	0.32	0.43	0.73	0.42	6.39	0.78	0.17	0.66	0.53	2.08	0.26	13.30
1898	0.17	0.14	1.06	1.50	1.06	1.81	2.57	0.10	1.06	2.16	0.24	0.24	12.11
1899	0.77	1.03	0.73	0.43	5.68	1.82	1.45	3.14	0.20	0.86	0.44	1.33	17.88
1900	0.12	0.72	0.76	1.38	0.88	0.62	1.37	1.62	2.21	0.85	0.64	0.26	11.43
1901	0.56	0.46	0.10	1.66	3.50	2.75	1.74	0.60	2.04	0.16	0.84	0.62	15.03
1902	0.24	0.27	0.09	0.15	4.77	3.80	0.79	0.66	0.42	0.24	0.99	0.52	12.94
1903	0.33	0.21	0.52	0.95	3.47	1.51	5.23	2.52	0.48	0.21	0.50	0.10	16.03
1904	0.15	0.57	0.86	0.34	2.24	2.29	0.43	0.51	0.26	0.51	T	0.45	8.61
1905	0.85	0.14	0.15	0.70	0.83	1.72	0.86	0.30	0.12	0.37	0.60	0.12	6.76
1906	0.17	0.11	0.31	0.09	3.32	4.37	0.17	1.63	0.93	0.57	0.74	1.72	14.13
1907	1.73	0.77	0.58	0.89	1.87	3.85	1.46	1.02	0.83	0.05	0.04	0.19	13.28
1908	0.16	0.75	1.70	0.28	1.87	3.25	0.39	0.85	1.17	1.18	0.05	0.27	11.92
1909	1.30	0.43	0.24	0.92	2.98	3.91	3.88	0.18	0.94	0.25	1.01	0.56	16.60
Means ..	0.73	0.50	0.54	0.89	2.04	2.93	1.89	1.21	1.06	0.62	0.68	0.54	13.63

From August 1880, to 1891, inclusive, the record is that of the U. S. Signal Service station at Fort Assiniboine.

LEWISTOWN, FERGUS COUNTY, MONTANA.

Elevation, 4.010 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1896	1.65	1.50	1.60	3.90	2.63	2.33	2.06	0.39	2.86	0.38	2.43	T	21.73
1897	0.90	1.84	1.15	1.10	0.84	3.54	3.38	.....	.....	2.55	3.97	1.10	.....
1898	0.55	0.80	3.16	1.15	4.41	5.11	.....	.....	.....	.....	.....	.....	.....
1899	0.40	.....	1.80	1.85	.....	.....	0.55	4.20	0.80	1.00	0.32	0.90	.....
1900	.....	0.50	.....	.....	.....	1.50	2.00	0.02	1.20	0.50	0.05	2.25	16.19
1901	T	0.02	1.10	1.10	4.45	3.50	3.60	0.70	0.40	T	0.65	1.30	.....
1902	0.55	1.30	.....	2.00	4.00	6.00	5.60	0.75	2.42	0.25	0.70	0.70	22.09
1903	0.47	1.30	0.55	2.90	4.70	1.75	3.45	0.60	0.20	T	0.05	1.00	13.52
1904	0.92	1.15	1.90	1.65	2.10	0.50	1.20	0.80	1.20	0.75	0.70	0.00	14.55
1905	0.40	1.00	0.55	1.10	2.15	4.50	2.00	0.60	2.10	0.95	0.89	1.31	19.10
1906	0.50	0.60	0.80	0.10	3.78	5.47	2.14	3.24	0.75	0.26	T	6.25	16.51
1907	1.88	0.47	0.92	0.45	2.25	3.90	0.04	1.04	2.00	5.80	0.25	0.40	22.10
1908	0.49	1.55	2.10	0.34	4.09	4.00	4.20	2.73	4.23	.....	0.91	1.21	.....
1909	1.25	0.10	1.27	1.19	2.50	0.46							
Means ...	0.76	0.93	1.41	1.45	3.16	3.61	2.52	1.37	1.65	1.13	0.91	0.87	19.77

MEAN TEMPERATURE.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Adel	2	22.1	21.8	27.2	39.4	46.3	52.6	60.2	59.1	51.9	42.5	34.2	26.8	40.3
Augusta	10	22.2	23.8	27.6	41.8	49.5	55.0	62.2	60.8	52.2	45.9	31.3	28.3	41.7
Babb	3	9.9	23.2	22.6	33.4	42.8	51.3	58.6	56.2	50.8	43.8	30.9	17.8	36.8
Cascade	5	19.5	30.0	34.1	45.8	51.5	59.4	68.0	66.0	59.0	48.6	41.6	29.8	46.1
Chester	6	9.5	13.6	27.0	41.3	52.3	57.6	68.3	62.6	55.6	46.4	30.9	20.2	40.4
Chouteau	6	20.3	23.1	31.0	40.9	48.2	56.3	64.6	62.1	55.3	45.8	35.7	27.8	42.6
Clear Creek	4	14.1	23.9	31.5	43.8	51.0	58.0	66.7	65.3	58.2	43.5	35.4	20.8	42.7
Cut Bank	11	19.2	18.0	23.8	38.3	48.8	54.8	60.6	60.6	50.4	41.5	27.2	21.2	38.6
Fort Benton	30	18.4	22.3	30.6	44.6	55.1	62.7	69.6	67.8	57.2	46.5	31.7	23.1	44.1
Fort Shaw	21	20.1	25.3	32.4	40.1	54.1	62.6	68.3	64.7	55.6	46.4	33.2	25.2	44.0
Goldbutte	2	13.4	24.0	25.8	31.3	44.0	53.4	62.4	59.8	52.4	42.5	31.8	18.8	38.3
Great Falls	18	24.8	25.6	32.4	45.5	53.6	60.9	67.8	66.7	57.1	48.6	34.8	31.7	45.8
Havre	29	13.5	15.0	27.3	42 7	54.1	62.4	68.1	66.9	57.6	43.6	30.6	21.2	41.9
Lewistown	12	21.9	23.9	28.8	42.1	50.4	57.5	64.2	63.0	53.7	46.2	32.6	26.9	42.6
Lonetree	2	23.0	29.0	31.8	44.7	50.9	59.0	67.8	67.0	59.8	47.1	38.1	28.4	45.6
Raymond	2	24.0	26..	29.2	37.0	47.9	54.0	63.0	64.0	58.8	44.0	32.5	29.8	42.6
St. Peter	5	25.7	23.5	28.5	41.9	47.9	53.3	61.8	62.6	53.3	46.6	35.1	28.9	42.4

FROST DATA.

STATIONS.	Length of Record, Years.	Average Date of First Killing Frost in Autumn.	Average Date of Last Killing Frost in Spring.	Earliest Date of Killing Frost in Autumn.	Latest Date of Killing Frost in Spring.
Adel	10	Aug. 24	June 25	Aug. 2	July 29
Augusta	10	Aug. 25	June 6	Aug. 2	June 27
Babb	4	Ang. 11	June 19	July 18	May 27
Cascade	6	Sept. 19	May 20	Aug. 28	June 21
Chester	6	Sept. 13	May 23	Aug. 20	June 12
Chouteau	11	Sept. 6	May 30	Aug. 8	June 21
Clear Creek	6	Sept. 26	May 23	Aug. 20	June 21
Cut Bank	7	Aug. 29	June 14	Aug. 2	July 15
Fort Benton	9	Sept. 30	May 16	Sejt. 14	June 6
Fort Shaw	2	Sept. 16	May 10	Aug. 28	May 18
Goldbutte	3	Sept. 1	May 22	Aug. 11	July 16
Great Falls	18	Sept. 16	May 7	Aug. 8	May 30
Havre	11	Sept. 14	May 15	Aug. 27	June 6
Lewistown	12	Sept. 3	June 5	Aug. 9	July 24
Raymond	3	Aug. 25	June 22	July 25	July 8
St. Peter	6	Sept. 3	June 9	Ang. 4	July 8

AVERAGE NUMBER OF DAYS WITH 0.01 INCH OR MORE PRECIPITATION.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Adel	11	5	4	8	7	11	10	6	5	6	4	3	5	74
Augusta	10	5	3	6	4	10	8	6	3	4	2	3	3	57
Babb	3	7	2	6	9	12	8	6	6	7	4	5	5	77
Cascade	5	5	4	6	8	12	12	8	7	6	4	2	4	78
Chester	7	3	2	2	2	8	8	3	4	3	2	2	5	44
Clear Creek	3	5	3	6	4	7	13	9	4	5	2	3	2	66
Clemons	3	6	4	6	5	9	6	4	6	5	3	4	3	61
Cut Bank	6	3	4	7	5	11	8	6	6	6	5	6	4	71
Fort Benton	22	5	4	5	5	9	7	5	4	4	4	4	4	60
Fort Shaw	20	6	5	5	6	8	8	6	5	4	4	5	5	67
Goldbutte	3	7	5	5	8	11	12	6	6	4	6	3	3	76
Great Falls	18	8	7	9	8	11	11	9	6	6	5	7	6	93
Havre	19	8	7	7	6	9	10	7	7	6	5	6	7	85
Highwood	3	4	4	6	12	12	12	10	8	8	10	3	3	94
Lewistown	10	5	5	6	5	9	10	5	5	4	3	4	4	65
Lonetree	4	6	4	7	6	12	12	6	5	5	5	4	3	75
Raymond	4	6	2	4	6	10	6	5	4	2	3	4	3	55
St. Peter	6	3	5	9	7	13	13	7	4	6	3	5	4	79

AVERAGE SNOWFALL.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Adel	10	10.7	7.5	15.0	11.8	4.1	0.4	0	0	1.5	11.2	7.2	12.9	82.3
Augusta	10	7.9	4.3	9.6	8.2	2.5	0	0	0	0.7	2.2	4.6	4.5	44.5
Babb	3	17.3	3.2	9.3	52.3	17.2	0	0	0	10.9	4.6	5.2	10.7	103.7
Cascade	5	9.6	7.0	9.5	5.6	0.8	0	0	0	0.5	2.8	3.2	5.9	44.9
Chester	7	4.6	2.5	2.2	0.9	0.6	0	0	0	0.4	0.3	2.0	3.2	16.7
Clear Creek	3	11.0	7.8	13.9	5.4	T	0	0	0	3.0	4.2	6.2	7.8	59.3
Clemons	3	13.5	12.0	19.5	16.0	3.0	1.0	0	0	2.0	22.5	9.4	5.5	104.4
Cut Bank	6	6.5	5.8	13.2	7.3	4.2	1.2	0	0.2	2.7	8.8	11.5	8.4	69.8
Fort Benton	7	7.8	4.1	6.4	3.0	1.1	0	0	0	0	1.5	3.9	6.4	34.2
Goldbutte	3	8.4	4.0	4.9	6.1	4.0	0	0	0	3.9	4.7	6.0	5.0	47.0
Great Falls	14	8.8	5.7	8.5	2.6	0.9	0	0	T	0.4	1.6	7.3	5.3	41.1
Havre	10	6.0	5.0	5.0	2.0	5.0	T	0	0	T	3.0	7.0	4.0	37.0
Highwood	3	8.5	4.0	13.0	11.2	6.1	0	0	0	0.7	0	T	15.2	58.7
Lewistown	10	7.6	8.7	12.6	6.6	4.7	T	0	0	0.9	6.8	8.2	10.1	66.2
Lonetree	4	12.5	5.3	9.8	6.0	1.0	0	0	0	1.2	4.8	4.8	4.4	49.8
Raymond	4	7.4	2.7	5.8	7.6	1.9	0	0	0	6.2	1.2	6.1	9.1	48.0
St. Peter	6	5.7	8.9	15.6	7.9	13.8	0.2	T	0	3.6	4.9	10.9	8.9	80.4

PREVAILING WIND DIRECTION.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Adel	11	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Augusta	10	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Babb	3	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Cascade	5	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Chester	7	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	nw.	w.	w.
Clear Creek	3	sw.	sw.	nw.	sw.	w.	w.	w.	w.	w.	w.	w.	sw.	w.
Clemons	3	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Cut Bank	7	w.	sw.	w.	w.	w.	w.	w.	w.	sw.	sw.	sw.	sw.	w.
Fort Benton	9	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Goldbutte	3	sw.	sw.	sw.	sw.	nw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Great Falls	18	sw.	sw.	sw.	sw.	sw.	w.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Havre	19	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Highwood	3	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.
Lewistown	10	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.	nw.
Lonetree	4	w.	sw.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
Raymond	4	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.	w.
St. Peter	6	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.	sw.

MONTHLY AND ANNUAL MEAN RELATIVE HUMIDITY.

Determined from Observations at 6 a. m. and 6 p. m. daily.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Havre, Mont.	22	80	81	77	62	63	63	57	62	56	68	75	79	69

Hydrographic Data, Section 29.

Summary of Climatological Data for the United States.

Preliminary Note.—Only the broader facts concerning the rivers are here given. Information in more detail can be procured by applying to the Director, United States Geological Survey, Washington, D. C.

This Section lies almost entirely within the Missouri River drainage. In the northwestern corner, St. Mary River and its tributaries rise and flow northeastward into Hudson Bay.

The Missouri River is formed by the union of three rivers, Gallatin, Jefferson and Madison, all rising in the immediate vicinity of Yellowstone National Park and flowing northward from the Continental Divide. Twenty miles north of the junction of these three rivers, the Missouri reaches an open valley over 40 miles in length, with good bench lands on either side. At the lower or north end of the valley, the river enters a narrow gorge or canyon about 60 miles long, the sides of which are timbered and have highly inclined slopes. Issuing from this canyon, the river flows through a narrow valley which broadens out occasionally. On the west side, beginning near Cascade, are wide flat bench lands of immense area, 50 to 300 feet above the water, extending, with occasional breaks, for several hundred miles down the river. The elevation of the benches in the vicinity of Great Falls is from 3,400 to 3,500 feet above sea level.

Sun River, an important tributary of the Missouri in this section, lies at an elevation of from 4,500 to 7,500 feet. It has its headwaters on the eastern slipe of the main divide of the Rocky Mountains and thence flows eastward to the Missouri. Its valley is heavily timbered and it has highly inclined slopes well covered with soil. The river has a fall of about 40 feet to the mile, a rocky bed, banks generally high, with bluffs on at least one side of the river. It frequently flows through narrow canyons and deep gorges, and is free from sediment except in flood season. Floods are frequently caused on this stream by the melting of the snows in the mountains, which sometimes disappear with great rapidity due to the warm "Chinook" winds. The snows which fall in April and May are melted by the warm winds before they can become solidfied, and floods from this source are also liable to occur.

Teton and Marias rivers rise on the eastern slopes of the Main Divide of the Rocky Mountains and flow in an easterly direction through a region of elevated plains and prairies to the Missouri. The general altitude of this country is from 3,000 to 4,000 feet; the plains rising towards the mountains by gentle terraces or elevations of about 5,000 feet. This is a broad grazing country, cattle finding an ample supply of grass, especially during years of ordinary rainfall.

St. Mary River heads near the Canadian boundary line on the Main Divide of the Rocky Mountains, in a region of perpetual snow and in the midst of numerous glaciers. It starts from the great Blackfoot Glacier, probably the largest in the Rocky Mountains within the United States, and is fed by at least a dozen lesser glaciers. These small streams unite within a short distance of their source and flow into a lake hemmed in

by high mountains, known as Upper St. Mary Lake. Below this lake and separated from it by a narrow strip of land is Lower St. Mary Lake, the aggregate length of the two lakes being about 22 miles. The river flows out of the lower lake, the elevation of which is 4,460 feet above sea level, and within two miles is joined by a stream nearly, if not quite as large as itself, known as Swift Current Creek, which is fed by the waters of Grinnell and four smaller glaciers. From the confluence of these streams to the international boundary, a distance of 12 miles, the St. Mary flows in a northerly direction, receiving Kennedy Creek a few miles before crossing the boundary. Entering the Province of Alberta, it empties into Belly River, its waters eventually finding their way through the Saskatchewan into Hudson Bay. A canal has been constructed in Canada by the Canadian Northwest Irrigation Company to convert water from the right bank of St. Mary River, about 5 miles below the international boundary line in Canada.

The following table shows in a general way the stream flow which can be expected to prevail for a given month of an average year. Opposite each month is given: First, the maximum flow for a 24-hour period which has been observed during the period covered by the table; second, minimum flow for a 24-hour period which has been observed during the period covered by the table; and third, the mean flow for that month during the entire period covered by the table. The remaining colums are computed from the third column of mean monthly discharge. Column four gives the mean flow for the entire period in cubic feet per second per square mile on the assumption of a uniform rate of discharge from each square mile of the drainage area. Column five gives the depth in inches to which the entire drainage area would be covered in an average month if all the water flowing from it during that month were conserved and distributed uniformly over the surface. It is used or comparing run off with rainfall, which is usually expressed in depth in inches. And, similarly in column 6, the discharge in acre-feet indicates the number of acres of land which would be covered to a depth of 1 foot if the total run-off during the month were spread uniformly over the area.

MONTHLY DISCHARGE OF ST. MARY RIVER, CARDSTON, ALBERTA.

For period, September, 1902, to December, 1908.
(Drainage area, 452 square miles.)

Month.	Discharge in Second-Feet.				Run-Off.	
	Maximum.	Minimum.	Mean.	Per Square Mile.	Depth in Inches on Drainage Area.	Total in Acre Feet.
January	.....	.....	245	.542	.62	15,100
February	.....	.....	264	.584	.61	14,700
March	.....	.....	357	.790	.61	22,000
April	2,560	160	685	1.52	1.70	40,800
May	3,480	590	1,810	4.01	4.62	111,000
June	18,000	1,830	3,900	8.63	9.63	232,000
July	4,860	1,100	2,320	5.13	5.91	143,000
August	2,010	385	1,050	2.32	2.68	64,600
September	2,300	198	685	1.52	1.70	40,800
October	1,690	144	596	1.32	1.52	36,600
November	1,620	109	443	.980	1.09	26,400
December	1,760	128	367	.812	0.94	22,600
The period	.....	.....	1,060	2.35	31.93	770,000

Note.—Ice conditions during portions of January, February, March, monthly means estimated; maximum and minimum values omitted.

MONTHLY DISCHARGE OF MILK RIVER, HAVRE, MONTANA.

For periods, June 1, 1898 to January 31, 1899; April, 1899 to November 1899; May, 1900 to December, 1900; April, 1901 to November, 1901; January, 1902 to December 1904; April 1905 to October, 1905; January 1906 to August, 1906; February, 1907 to December 1907; March, 1908 to November, 1908.

Months.	Discharge in Second-Feet.			Run-Off.
	Maximum.	Minimum.	Mean.	Total in Acre Feet.
January	.....	.....	181	11,100
February	.....	.....	258	14,300
March	.....	.....	277	17,000
April	4,900	32	684	40,700
May	7,670	24	559	34,400
June	4,620	10	883	52,500
July	8,960	0	386	23,700
August	890	0	128	7,870
September	339	1	103	6,130
October	355	1	118	7,260
November	169	1	132	7,600
December	125	110	110	6,760
The period	8,960	0	31	230,000

MONTHLY DISCHARGE OF MARIAS RIVER, SHELBY, MONTANA.

For periods, April, 1902 to March 1904; May, 1905 to August 1905; April, 1906 to June, 1906; May, 1904 to December, 1904; November, 1905 to December, 1905.

MONTHS.	Discharge in Second-Feet.			Run-Off.
	Maximum.	Minimum.	Mean.	Total in Acre-Feet.
January	1,240	408	934	57,400
February	1,600	460	897	48,900
March	7,400	570	1,180	72,600
April	6,800	305	873	51,900
May	5,240	600	2,750	169,000
June	7,800	1,170	3,170	189,000
July	16,305	435	1,930	119,000
August	1,400	198	503	30,000
September	1,240	205	442	26,300
October	895	185	456	28,000
November	2,400	150	503	29,900
December	2,200	250	624	38,400
The period	16,300	150	1,190	862,000

MONTHLY DISCHARGE OF SUN RIVER, SUN RIVER, MONTANA.

For period, October, 1905 to December 31, 1908 (except January and February 1906, and February, 1908.)

MONTHS.	Discharge in Second-Feet.			Run-Off.
	Maximum.	Minimum.	Mean.	Total in Acre-Feet.
January	1,790	231	428	26,300
February	428	238	510	28,300
March	560	89	282	17,300
April	2,800	100	733	43,600
May	5,920	658	2,180	134,000
June	17,400	1,000	4,740	28,200
July	6,200	222	1,880	116,000
August	1,400	82	486	29,900
September	645	47	336	20,000
October	645	80	322	19,800
November	1,700	206	473	28,100
December	475	225	338	20,800
The period	17,400	47	1,060	512,000

Climatological Section No. 30.—NORTHEASTERN MONTANA.

Introductory Remarks.

Climatological Section No. 30 extends from longitude 109° 30′ west to the eastern boundary of the State, and from the 47th to the 49th parallel of north latitude. Embracing an area of about 32,000 square miles, or nearly four times that of the State of Massachusetts, it had in 1900 a population not exceeding 8,000. While the population has increased rapidly the past three years, it is probable at the present time less than one to the square mile.

This vast area is in the main an undulating plain, with a gradual descent from west to east, the greater portion of which has an elevation above sea level of approximately 3,000 feet. In the western portion there is a small mountainous area, embracing the Little Rocky and Judith groups of mountains, in which there are a few peaks above 5,000 feet altitude.

The Missouri River flows nearly due east across the section, dividing it into two nearly equal areas. The drainage system is made up mainly of many small tributaries of this river, but also includes the lower portions of the more important sub-drainage basis of the Milk River, on the north, and the Yellowstone and Musselshell rivers on the south side. Many of the smaller streams that flow directly into the Missouri River originate on the open plains, and having no perpetual source of supply, such as is furnished by the snowfall in high mountain ranges, the volume of water carried by them decreases rapidly during July, after the usual wet season, and in most cases ceases to flow late in the summer or in the early autumn. More than half of the area north of the Missouri is within the drainage basin of the Milk River, which is the source of supply for several important irrigation projects. The largest of these is the Milk River project of the U. S. Reclamation Service, the greater portion of which comes within the district under discussion, and which contemplates the reclaiming of 150,000 acres of rich agricultural land. A large part of the lower Yellowstone project of the Reclamation Service is also in this section, and covers a large area of productive land in eastern Dawson County.

There is perhaps a larger percentage of arable land in this section than in any other equal area in the State. From the Missouri river to the Canadian boundary there is comparatively little waste land, except in the western part, which includes the Little Rocky, and Judith Mountain districts. To the south of this river in northern Fergus and Dawson counties there is a considerable area of so-called "bad lands," very little of which is tillable, but all of which is valuable for grazing purposes.

Until within the last five years the broad plains of this part of Montana were considered useful only as grazing lands for cattle and sheep, but recently the country is being rapidly appropriated for actual farming purposes, and grain raising has already become an important industry in southern Dawson and western Fergus counties, and along the line of the Great Northern railway, in Valley and Chouteau counties. The soil is for the most part a rich loam, underlaid with a clay subsoil, the formation and texture being well adapted to the conservation of moisture, a quality

especially favorable for what is termed dry farming, that is farming without irrigation. Sand and gravel abound in certain sections, but there are vast tracts of rolling or level lands practically free from boulders or gravel to such an extent as to interfere with cultivation.

Climatic Characteristics.

This section of Montana is subject to somewhat lower temperatures, higher winds, and more sudden changes than other parts of the State. The winters are normally long, and there is no well defined spring season, freezing weather and snow storms often extending into June. The summer weather usually begins rather suddenly near the middle of June, and the long hot days that follow during the next three months, are exceptionally favorable for the rapid growth of native vegetation, as well as the hardier cereals, such as wheat, oats and barley, and such forage crops as alfalfa, clover and timothy. The autumn months are usually dry, and as a rule there is little severe weather until December. Like other parts of the State this section is subject to Chinook winds during the winter, resulting in frequent and often quite extended periods of mild temperatures.

The mean annual temperature is above 40° over most of the district, and is but slightly below this in the coldest localities. In the eastern parts of Valley and Dawson counties the winter temperature averages about 10°, in other places it is 15° or above. January and February are the coldest months, and the greatest monthly change is from March to April, when there is an increase in the monthly mean of fifteen to twenty degrees. The normal temperature for April is about the same as the annual mean, and while temperatures below zero sometimes occur in this month, it usually marks the beginning of the growing season for the native grasses. The season advances rapidly from May 1st to the middle of June, and fairly uniform summer temperatures prevail from this time to the middle of September or later, while with sufficient moisture, vegetation will often flourish till the end of October. The average length of the growing season is between four and five months.

The annual range of temperature here is very great. The district lies directly in the path of the cold waves that move southeastward from the Canadian Northwest, and almost every winter witnesses one or more periods with minimum temperatures of thirty to fifty degrees below zero. On the other hand, largely because of the long mid-summer days, the mid-day temperatures of this season frequently rise above ninety degrees, and maxima above one hundred are frequently recorded in the eastern and southern portions during July and August.

Precipitation.

The average annual precipitation is between thirteen and fifteen inches over the greater portion of this District. There is a considerable area in eastern Dawson County, where it exceeds fifteen inches, and there are small areas bordering on the Missouri River where less than twelve inches fall. The distribution of moisture throughout the year is highly favorable for its best utilization in crop growth by dry farming methods, since more than half the annual amount is deposited in light rains from April to

July inclusive, which covers the critical periods of the growth and maturing of all the principal crops raised in this latitude.

The rainfall is less variable from year to year than in most humid climates, and assuming that an annual precipitation of ten or twelve inches is sufficient for successful dry farming, the records disclose only rare instances of extended drought periods. The annual precipitation at Glasgow was below ten inches only two years in twelve; at Glendive the least was nine and nine-tenths inches in a record of seventeen years; in twenty years' record it fell below ten inches at Poplar but once, and at Springbrook, the total has exceeded fifteen inches every year but one during the past eight years.

The precipitation from November to March is practically all in the form of snow, but since this is the driest portion of the year it follows that heavy falls of snow are comparatively rare. The winter snows are normally light and dry, and the high winds that usually accompany or follow them, carry most of the snow into ravines, leaving the ranges bare and accessible for grazing purposes throughout most of the winter.

The average annual snowfall for the section is about forty inches. Nearly half of this falls during the three months, March, April, and November, and there being much mild weather in these months it usually remains on the ground only a short time.

The prevailing winds are from the west over most of the section.

R. F. YOUNG, Section Director.

NORTHEASTERN

PRECIPITATION IN NORTHWESTERN MONTANA. MONTHLY, ANNUAL, AVERAGE AMOUNTS, IN INCHES AND HUNDREDTHS.

CULBERTSON, VALLEY COUNTY, MONT.

Elevation, 1,927 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1900	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.20	.....
1901	0.39	0.18	0.12	0.30	0.16	3.55	1.66	0.37	1.96	0.07	0.19	0.29	9.24
1902	T	1.08	0.82	0.44	3.01	3.91	2.04	0.82	T	0.62	0.53	0.33	13.60
1903	0.23	0.17	0.05	0.13	4.04	2.46	2.74	3.49	1.21	0.12	0.12	0.43	15.19
1904	0.34	0.27	1.79	0.45	1.40	1.81	2.87	0.64	0.08	0.19	T	0 39	10.23
1905	0.23	0.47	0.26	T	1.21	2.66	1.99	0.90	2.11	.....	0.24	0.07	.....
1906	0.71	0.05	0.04	2.20	3.50	8.60	0.45	1.99	2.93	0.28	1.21	0.47	22.43
1907	0.67	0.12	0.37	.....	.....	.....	1.48	2.02	0.15	.....	.....	.....	.....
1908	.....	.....	.....	.....	.....	.....	2.60	0.46	1.35	1.33	0.05	T	.....
1909	0.80	T	0.10	0.02	2.70	2.86	3.83	.....	.....	.....	.....	.....	.....
Means ...	0.42	0.29	0.44	0.51	2.29	3.69	2.18	1.34	1.22	0.44	0.33	0.27	13.42

GLASGOW, VALLEY COUNTY, MONT.

Elevation, 2,092 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1894	0.30	.....	.....	.....	1.52	1.86	T	0.37	0.22	2.41	0.15	0.50	.....
1895	0.84	0.97	0.20	0.42	1.18	2.49	0.40	0.54	0.44	0.30	0.98	1.25	10.01
1896	0.71	0.27	0.86	3.28	2.56	2.41	1.13	0.22	0.43	0.45	1.75	T	14.07
1897	0.72	0.75	2.50	0.69	0.18	1.67	0.74	0.12	0.05	1.28	0.68	0.25	9.63
1898.	0.20	0.65	3.50	1.43	0.65	2.37	1.58	0.11	2.02	2.00	0.57	0.07	15.15
1899	0.40	1.20	1.35	0.89	5.69	1.92	1.11	0.25	0.00	1.64	0.41	0.69	15.55
1900	0.11	0.54	1.47	1.16	1.62	0.15	0.20	0.93	0.83	0.71	0.78	0.91	9.41
1901	0.90	0.27	T	0.76	1.01	4.06	1.73	0.65	2.13	0.02	0.84	0.64	13.01
1902	0.20	1.40	1.24	0.51	4.20	1.77	0.03	0.32	0.15	0.23	1.39	0.54	11.98
1903	0.17	0.07	0.18	0.12	5.35	2.30	1.37	1.02	0.14	0.09	0.44	0.07	11.32
1904	1.50	0.55	4.06	0.75	0.70	1.59	0.35	0.42	0.21	0.22	0.00	1.44	11.79
1905	0.13	0.22	0.65	.....	.....	.....	2.47	0.18	0.72	0.10	9.30	0.17	.....
1906	0.20	0.05	0.14	1.92	5.69	7.12	0.34	1.26	1.78	0.25	0.25	1.20	20.20
1907	1.40	0.17	1.08	0.67	1.50	3.35	0.88	1.97	0.46	0.00	T	0.30	11.78
1908	0.15	.....	1.31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Means ...	0.53	0.55	1.32	1.05	2.45	2.54	0.88	0.60	0.68	0.75	0.61	0.57	12.61

GLENDIVE, DAWSON COUNTY, MONTANA.

Elevation, 2,069 feet.

Year.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1889	0.30	1.00	0.30	0.30	1.65	0.75	1.39	1.40	2.95	0.03	0.06	0.03	10.16
1890	0.80	0.03	0.04	0.03	1.44	3.06	1.06	0.31	1.52	1.25	0.29	0.30	10.13
1891	0.45	0.50	0.90	2.45	2.25	5.60	1.92	0.15	0.67	2.83	0.30	0.35	18.37
1892	0.02	0.80	0.50	2.27	3.25	4.10	3.08	0.70	0.95	0.20	0.58	1.30	17.75
1893	1.52	0.30	0.50	0.89	2.66	1.25	0.99	0.53	1.50	0.95	1.25	0.70	13.04
1894	0.50	0.20	2.60	2.30	2.97	5.85	0.01	0.80	0.57	1.67	0.48	0.75	18.70
1895	0.60	0.90	0.50	1.04	2.00	5.70	1.84	0.20	0.10	0.22	1.30	0.90	15.30
1896	1.70	0.80	1.50	1.60	7.03	4.20	1.53	0.70	0.75	0.40	2.00	0.30	22.51
1897	1.70	1.20	2.50	0.40	0.95	1.48	1.70	0.30	0.10	0.60	1.00	0.30	12.23
1898	0.20	0.30	2.10	2.00	2.00	5.70	0.40	0.22	1.70	2.82	0.80	0.40	18.64
1899	0.70	0.80	1.70	2.05	2.65	3.85	5.42	0.70	0.05	1.80	0.20	0.90	20.82
1900	0.01	0.70	1.50	0.59	0.78	0.95	0.47	2.40	2.90	1.10	0.85	0.17	12.42
1901	0.80	0.93	0.81	0.73	T	4.67	3.65	0.15	2.24	T	0.40	1.50	15.88
1902	0.50	1.60	2.90	0.30	4.81	2.87	1.75	2.50	0.15	0.30	1.00	1.50	20.18
1903	1.32	0.40	0.40	0.44	1.29	1.30	3.55	2.27	1.40	T	T	0.75	13.12
1904	1.45	0.40	2.20	0.55	0.80	2.55	0.15	0.75	0.15	T	0.00	0.90	9.90
1905	0.80	0.70	0.41	T	2.35	3.78	1.41	0.18	1.42	0.55	.....	.....	.....
1906	.....	.....	0.73	2.13	5.18	3.75	0.24	2.87	.....	.....	0.43	1.06	.....
1907	0.65	0.42	0.45	0.20	1.90	3.93	1.07	1.32	T	T	0.06	0.46	10.46
1908	0.37	0.76	.....	.....	2.40	1.91	1.63	.....	1.84	3.10	T	0.10	.....
1909	0.54	0.53	[illegible]	0.33	4.78	5.14	4.17	0.63	0.70	T	0.44	0.47	17.33
M'n.	0.75	0.66	1.13	1.03	2.53	3.45	1.78	0.95	1.08	0.89	0.57	0.66	15.48

MEAN TEMPERATURES.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Chinook	10	13.8	15.7	23.3	43.0	54.5	62.6	69.9	67.4	56.8	45.2	28.1	22.6	41.9
Clear Creek	4	14.1	23.9	31.5	43.8	51.0	58.0	66.7	65.3	58.2	43.0	36.6	25.4	43.1
Culbertson	7	7.0	9.2	24.1	42.0	54.0	61.3	67.6	65.8	55.5	44.6	29.0	15.2	39.6
Fort Maginnis	8	15.7	19.4	31.2	41.4	49.0	57.8	63.8	63.4	53.2	42.7	33.6	25.6	41.4
Glasgow	14	8.8	9.6	22.6	44.3	56.2	62.7	69.9	67.8	56.0	43.8	25.5	15.7	40.2
Glendive	20	13.2	13.0	26.0	46.0	56.3	65.1	72.1	71.0	59.4	47.3	29.6	20.8	43.3
Jordan	4	11.9	19.8	30.3	39.0	48.8	58.9	69.0	67.8	60.9	46.1	31.2	22.4	42.2
Joplar	24	6.3	7.6	22.7	42.9	54.3	63.3	69.7	67.3	57.1	44.6	27.1	14.4	39.8
Ridgelawn	6	9.6	10.5	26.1	44.4	56.9	62.9	67.9	67.1	56.3	46.7	29.4	17.8	41.3
St. Pauls	9	21.9	19.0	26.8	42.7	50.4	59.2	66.5	67.0	55.8	47.2	33.4	27.1	43.1
Springbrook	8	14.3	15.6	27.0	42.4	51.6	61.3	67.2	67.4	58.5	46.3	33.6	21.7	42.2
Tokna	4	11.1	17.8	26.7	43.1	51.5	63.9	70.2	68.4	61.2	46.2	32.0	19.8	42.7

DIRECTION OF PREVAILING WIND.

Stations.	Length of Period, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Chinook	10	w	w	w	w	w	w	w	w	w	w	w	w	w
Clear Creek	4	sw	sw	nw	sw	sw	w	w	w	w	w	w	sw	w
Culbertson	7	n	nw	w	w	e	w	w	e	w	w	w	w	w
Glasgow	7	w	w	w	w	w	w	w	w	e	w	e	w	w
Glendive	10	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw	sw
Poplar	10	w	nw	nw	n	n	w	w	w	w	w	w	w	w
Ridgelawn	6	w	w	nw	nw	se	nw	nw	nw	nw	w	nw	w	nw
St. Pauls	9	w	w	nw	w	w	w	w	e	nw	se	w	nw	w
Springbrook	8	sw	sw	sw	nw	ne	e	w	se	nw	w	w	sw	sw
Tokna	3	w	nw	n	nw	e	w	n	s	w	w	w	sw	w

AVERAGE NUMBER OF DAYS WITH .01 INCH OR MORE OF PRECIPITATION.

Stations.	Lenth of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Chinook	8	4	3	3	3	8	8	5	6	3	2	4	2	51
Clear Creek	4	5	3	5	4	10	13	5	5	5	6	3	2	66
Culbertson	7	4	3	3	3	9	13	6	6	4	3	2	3	59
Glasgow	9	3	4	4	5	9	10	5	4	4	4	4	4	61
Glendive	17	5	4	5	4	6	8	5	5	3	3	3	4	55
Jordan	3	4	5	2	3	5	4	4	2	1	1	1	1	33
Poplar	10	5	6	6	5	6	9	6	6	4	4	4	4	65
Ridgelawn	6	4	3	4	2	6	8	5	4	4	1	2	4	47
St. Pauls	8	5	5	5	5	10	9	6	5	5	4	4	4	67
Springbrook	8	7	7	8	4	11	10	7	7	5	4	5	7	82
Tokna	3	3	3	5	5	8	13	5	8	4	3	2	3	62

MONTHLY AND ANNUAL SNOWFALL.

Stations.	Length of Record, Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Chinook	8	6.8	4.1	4.9	1.0	2.4	0.0	0.0	0.0	T	0.4	5.8	2.1	27.5
Clear Creek	4	17.5	7.8	13.9	4.4	T	0.0	0.0	0.0	3.0	5.7	9.0	7.8	69.1
Culbertson	7	3.8	2.9	4.1	T	T	0.0	0.0	0.0	T	T	2.1	2.6	15.5
Glasgow	7	2.7	5.4	5.5	0.3	0.0	0.0	0.0	0.0	0.0	0.2	5.1	6.3	25.5
Glendive	13	8.2	7.9	10.9	2.9	1.3	0.0	0.0	0.0	T	1.2	6.3	6.7	45.4
Poplar	13	7.0	5.9	12.3	2.3	0.7	0.0	0.0	0.0	T	1.1	5.8	5.4	41.5
Ridgelawn	5	7.0	5.9	4.4	0.6	T	0.0	0.0	0.0	0.0	0.0	3.5	6.9	28.3
St. Pauls	9	6.1	9.7	10.6	5.3	2.9	0.2	0.0	0.0	0.2	4.3	7.0	9.3	55.6
Springbrook	7	9.5	7.8	14.6	3.6	2.2	0.0	0.0	0.0	3.6	3.7	4.0	10.0	59.0
Tokna	4	8.6	6.4	5.7	1.3	T	0.0	0.0	0.0	0.2	T	1.8	6.6	30.6

FROST DATA.

Stations.	Length of Record, Years.	Average Date of First Killing Forst in Autumn.	Average Date of Last Killing Forst in Spring.	Earliest Date of Killing Frost in Autumn.	Latest Date of Killing Frost in Spring.
Chinook	10	September 11	May 13	August 26	June 6
Clear Creek	3	September 26	June 2	September 12	June 21
Culbertson	7	September 5	May 30	August 13	June 10
Glasgow	14	September 12	May 22	August 15	June 20
Glendive	16	September 22	May 12	September 11	June 9
Jordan	4	September 13	May 10	August 17	May 13
Poplar	16	September 11	May 16	August 22	June 23
Ridgelawn	6	September 21	May 13	September 12	May 20
St. Pauls	10	September 16	May 29	September 9	June 30
Springbrook	7	September 20	June 1	September 2	July 16
Tokna	3	September 2	May 25	August 20	June 15

Hydrographic Data for Section 30.

Summary of Climatological Data for the United States.

Preliminary Note.—Only the broader facts concerning the rivers are here given. Information in more detail can be procured upon application to the Director, United States Geological Survey, Washington, D. C.

This section lies wholly within the Missouri River drainage basin. The main Missouri flows through the central portion of the section in an easterly direction and is joined by such important tributaries as Musselshell and Yellowstone rivers from the south and Milk River from the north.

Several important irrigation projects are under way in this section and include one on the lower Yellowstone River and two on Milk River.

Milk River rises in the undulating foothills of the Rocky Mountains in northwestern Montana near the boundary line between the United States and Canada. Its headwaters flow northeastward into Canada, and for about 100 miles its course is eastward, parallel with the international boundary. It then turns to the southeast, passes across the northern part of Montana, and empties into the Missouri River. The valley of this river is fertile and well adapted to the raising of the hardier grains.

The area drained by Milk River after it re-enters the United States is one vast rolling prairie land, excellent for grazing purposes. Owing to its great length, Milk River in the lower section is at such a distance from the high snow fields of the Rocky Mountains that the quick melting of the snow in the spring does not maintain a constant flow in the river as it otherwise would. The snowfall on the lower basin in some winters is considerable, but the altitude being relatively low, whenever a warm wind or "Chinook" as it is called strikes the snow, it melts with exceeding rapidity, finds its way into the creeks and causes them to rise to considerable heights. Milk River, as a result is a very flashy stream, rising and falling suddenly, eroding its banks at each rise. So variable a stream, as a rule, has a low discharge in summer, and Milk River is no exception to the rule.

In the early part of June, 1906, there occurred the most destructive flood ever witnessed in the Milk River valley since its settlemnt. The

flood was brought about by very heavy and excessive precipitation over the entire lower drainage basin of the river at that time, following a somewhat abnormal rain in the latter part of May. The flood was preceded by a time of drought extending over a period of two years or more, while the months immediately preceding were exceedingly dry. It commenced to rain in the middle of May and from that time until the end of the month the average precipitation in the valley was from 4 to 5 inches, much above the average for the month of May. This was followed by an average rainfall of nearly 4 inches from June 6 to 13, inclusive, considerably over half of which fell in 24 hours. The ground was already thoroughly saturated while all the waterholes and reservoirs had been wholly or partially filled. This, however, taken in connection with the enormous drainage area, accounts for the large volume of run-off water. Many thousands of dollars damage was caused by destruction of reservoirs and the overflowing of lands.

The following table shows in a general way the stream flow which can be expected to prevail for a given month of an average year. Opposite each month is given: First, the maximum flow for a 24-hour period which has been observed during the period covered by the table; second, the minimum flow for a 24-hour period which has been observed during the period covered by the table; and third, the mean flow for that month during the entire period covered by the table. The remaining column is computed from the third column of mean monthly dischorge. The discharge in acre-feet indicates the number of acres of land which would be covered to a depth of one foot, if the total run-off during the month were spread uniformly over the area.

MONTHLY DISCHARGE OF MILK RIVER, MALTA, MONTANA.

For Period Aug. 1–Oct. 31, 1902; Jan. 1, 1903–Aug. 31, 1905; April 1–Nov. 30, 1906.

Month.	Discharge in Second-Feet.			Run-Off.
	Maximum.	Minimum.	Mean.	Total in Acre-Feet.
January	.....	.....	108	6,640
February	.....	.....	102	5,660
March	618	29	239	14,700
April	8,790	0	1,260	75,000
May	3,890	0	527	32,400
June	10,900	6	1,470	87,500
July	2,000	9	222	13,600
August	770	1	166	10,200
September	770	0	126	7,500
October	251	0	100	6,150
November	228	14	77.5	4,610
December	490	15	96	5,900
The Period	10 900	0	374	270.000

Irrigation Projects.

The following information was furnished the Bureau in regard to national and state irrigation projects:

Government Reclamation Projects in Montana by H. N. Savage, Supervising Engineer, U. S. Reclamation Service.

Cary Land Act Projects by J. W. Wade, State Engineer.

GOVERNMENT RECLAMATION PROJECTS IN MONTANA.

The Government reclamation projects are the result of the passage of the Act of June 17, 1902, known as the National Reclamation Act. This Act provided that the money reeived from the sales of public lands in Montana and other Western States and Territories shall be used as a Reclamation Fund for the construction of the works necessary to irrigate arid lands in those States and Territories. By a wise provisions of the law this Fund was made revolving. As soon as any work is completed the owners or entrymen upon the lands benefited must begin to return the cost of the constructed works, payment being required in ten annual installments without interest. The money so returned can be used over and over again in the construction of other works. To prevent speculation or the acquisition of large areas under one ownership it was further provided that no man can own more than 160 acres under any of these projects and such owner must actually reside upon and cultivate his land.

The Secretary of the Interior has withdrawn from the operation of the public land laws the lands to be reclaimed by these various projects, and title to them can only be secured in accordance with rules made by him under authority of the Act. All settlers must make homestead entries and comply with the law as to settlement, cultivation and residence as in other cases, and in addition must pay the pro rata cost of the water rights. The irrigated lands have been divided into farm units which vary in size from 40 to 160 acres.

By the Act opening to entry the ceded portion of the Crow Indian Reservation such Indian lands as are deemed practicable for irrigation under the Reclamation Act, are subject to withdrawal and can be disposed of under the provisions of the Act and the settlers shall pay in addition to the cost of construction and maintenance, the appraised value of these lands. The Act further provides that the payment of this appraised value shall be made in annual installments not to exceed five. This is best illustrated by the Huntley Project where the lands segregated for reclamation were formerly part of the Crow Indian Reservation. When this project was opened, in addition to the charge of $30 per acre for construction and the maintenance and operation charge, there was an additional cost of four dollars per acre, that being the appraised value of the Indian lands, and this payment was specified to be made as follows:

$1 per acre at time of entry and the balance in four annual installments of 75 cents per acre each.

Irrigation works for the reclamation of allotted lands in the several Indian reservations in the State are now being constructed by the National Reclamation Service.

The following table shows expenditures made on projects in Montana to June 30, 1910:

Project.	Expenditure to June 30, 1910.
St. Mary	$ 273,000.00
Huntley	918,000.00
Sun River (Fort Shaw Unit)	630,000.00
Milk River	552,000.00
Lower Yellowstone	2,896,000.00
Blackfeet	230,000.00
Flathead	281,000.00
Fort Peck	60,000.00

From time to time as funds became available for use on the several projects, the extension of construction work has been authorized and allotments made of funds necessary to carry on the work. As the annual additions to the fund have usually become available about January 1 of each year, the annual allotments have been based upon the calendar year rather than the fiscal year. In making these allotments it has been found advisable to outline a general fiscal program. The engineers of the service submit their plans of work and estimate of the funds necessary to carry them out. A conference is held for consideration of these plans and estimates and finally a program is formulated and submitted for the approval of the Secretary of the Interior. The allotments for projects within the State of Montana from the initiation of work under the Reclamation Act to December 31, 1910, are as follows:

Project.	Allotment to December 31, 1910.
Huntley	$ 955,000.00
Milk River	593,000.00
St. Mary	298,000.00
Sun River	672,000.00
Lower Yellowstone	2,910,000.00

The subdivision of these various projects into farm units was intended to limit the size as suitable for a home and also to enable one to acquire a comfortable livelihood from the products of the land. Investigations leading to a determination of the size of the unit were based on the land actually under cultivation by irrigation in the vicinity adjacent or nearest to the project in question, on the results there shown and on the possible crops that could be raised in the locality. In the investigations incident to the determination of a suitable area for Huntley farms, farmers of Billings to the number of one hundred and twenty-three living within five miles of the city, who were irrigating farms containing forty acres or less of irrigated lands, were personally interviewed and statements obtained from them relative to their land irrigated; also their opinion

as to the sizes of their farms and the amounts of land that they could irrigate, and their almost unanimous opinion was that forty acres of irrigable land was as much as one person could comfortably handle and obtain the best results. In this manner investigations were carried on for over a year and it was finally decided, after a thorough study of the investigations mentioned, that in so far as was practicable when the soil was of good character, and on those lands nearest to and adjacent to the townsites, the units could properly be limited to forty acres of irrigable land, with, so far as practicable, one hundred and twenty acres of grazing land, making a total of one hundred and sixty acres. Many of the Huntley farm units contain upwards of 80 acres of irrigable land.

Throughout all irrigation projects, at intervals of from five to six miles, as near as possible to shipping points and on railroads, if such traverse the projects, there are townsites located, the lands on which they are located being withdrawn for townsite purposes. These townsites are surveyed, located and platted. In placing them it was considered good policy to have the towns close together to insure shipping facilities and to give a chance for schools, churches and supply points close to the farms. In connection with most of the townsites one, two-and-a-half and five acre tracts have been laid off, which are suitable for a home with garden, orchard and cow lot, but which are close tot he business of the town.

In disposing of the town lots it was decided to appraise only a portion of the site to insure compact settlement. Whenever in any particular townsite the growth is such that there is a demand for more lots, another appraisement will be made in accordance with the demonstrated and prospective value of the lots at that time.

A sufficient number of town lots are provided so that each farm owner, if he so desires, may purchase a lot in town and after having secured title to his farm can live where he will enjoy the social and commercial advantages incident to the settlement, while if he cares to remain on the farm he need never be more than three miles from a railway station, school house, store, churches, creameries and such business and social advantages.

The average distance of all the 585 farms on the Huntley project to a railway station on both the Northern Pacific Railway and the Chicago, Burlington & Quincy Railroad is only one and five-eighths miles.

During 1909 and 1910 the work of the Service in Montana was carried on as rapidly as men and money would allow. Satisfactory progress has been made on all projects where construction has begun. The money expended from the fund is returned through the system of yearly payments by the settlers, becoming available for use over and over again. In addition to the reclamation funds future developments may make necessary a direct loan from the United States Treasury, and the Sixty-first Congress, by an act approved June 25, 1910, authorized the issuance of certificates of indebtedness to the amount of $20,000,000.00 for the

purpose of more rapidly advancing work on reclamation projects throughout the United States.

The first work of the Service was the inspection and preliminary survey of various projects, and the withdral from settlement of such lands as were found to be adapted to reclamation. Many of these proved upon investigation to carry so great an initial cost that they were not considered feasible for immediate development.

At present the land withdrawn from entry for the various projects in Montana amounts to about 1,450,000 acres, all of which may in time become homesteads or is now in private ownership.

Where the land to be reclaimed is in the ceded portion of an Indian reservation the cost price to the settler includes the appraised price of the land for return to the Indians and the pro rate expense of canal construction. In many instances the main canals skirt the foothills, cutting the homestead in two, and in such cases, of course, the annual charge is not made for canal maintenance for the land that lies above the ditch, but all land below the ditch, whether it is cultivated or not, must bear its pro rata yearly assessment. For example, if the farm unit is 160 acres, 80 acres of it being below the ditch and water is used on only 20 acres, in addition to the building charge payment, the operation and mainfenance charge for water at 50 cents an acre would be $40 for the year, or $2 an acre for the land actually irrigated; or, if the whole 160 acres is below the ditch and only 20 acres irrigated, the cost per acre on the land actually under water would be $4 an acre, thus it is important for the land owner to place under irrigation all of his land with as much celerity as possible.

Under the terms of the Reclamation Act settlers must pay for their land in ten annual installments. The law does not specify how these payments shall be divided, but the Secretary of the Interior, under authority granted him by the Act, has usually stipulated that the payments shall be equal.

On the Huntley, Fort Shaw Unit of the Sun River, and Lower Yellowstone projects the first payment must be made when the settler makes his filing in the local land office. A year of grace is given for the payment of the charge for water, but if the first year's operation and maintenance charge is not paid when due no more water will furnished until the delinquent payment has been made.

Two illustrations will show what these first payments actually amount to, both being taken from the Fort Shaw Unit of the Sun River project, on 88 acres, 81 of which are good tillable land, the sum of $283.50 was paid, which includes operation and maintenance charge for the first year. On a second tract of 80 acres, of which 67 acres can be irrigated, $234.50 was paid. On this project operation and maintenance is charged for only such acreage as can ultimately be placed under irrigation, which explains the difference in the sums paid.

An experimental farm in charge of an expert irrigator has been established on the Huntley project and is operated in conjunction with

the Department of Agriculture and the Montana State Experiment Station so that the settlers may have the benefit of seeing demonstrations of the method of building laterals, preparing the soil, seeding and applying water to the growing crops, thus escaping many costly experiments and discouraging failures common to inexperience. An expert in this line of work has also beeen giving instructions and demonstrations relative to the method of irrigation on both the Fort Shaw Unit of the Sun River and the Lower Yellowstone projects.

To avoid the difficulties with speculators there is little doubt that a universal rule will be made that the first installment will become due and payagle when the entry is made upon all future openings of homestead lands.

The greatest care should be and apparently is being taken to preserve these lands for the actual settler. However, a homesteader's life is not a paradise for a poor man and can never be. The settler should be a man of some means, but not necessarily wealthy. There is no opening for the man who is penniless and the entryman with less than a thousand dollars, if the first payment is due at the time entry is made, is taking long chances.

It should be remembered that the land which can be homesteaded is raw and wild in all respects just as it was created, except for the natural changes. The main ditch and laterals are completed to the margin of each homestead. The farm ditches to conduct the water through the fields are to be laid out and dug by the settler; the land must be fenced and at least some sort of habitable buildings erected; the land must be broken and cropped and the entryman and his family must have means of subsistence until the first season's products are available. If the entryman has means to break and crop his entire place he not only has the advantage of full returns from his land but has also the use and full value of all the water, while if for lack of time or money to cultivate all his land only a portion of it can be used, he must still pay for water for every acre in his claim that is capable of being irrigated. Prospective settlers should figure this out for themselves.

Without the slightest projeudice, and with full knowledge and appreciation of what the Government Reclamation Service means in the future progress and development of the State, it is suggested that settlers may well take time to ascertain prices and conditions of other lands, some of them in the nearby localities.

At this time it may not be deemed oult of place to repeat the advice which has been given by this bureau to thousands of people who have written for information concerning land in Montana. In all cases make a trip of personal inspection before completing a bargain. No person who has followed this suggestion has ever regretted doing so while many who did not have lost splendid opportunities.

Concrete Lined Section, Dodson South Canal at Point of Rocks near Dodson. Milk River Project, June 30, 1910.

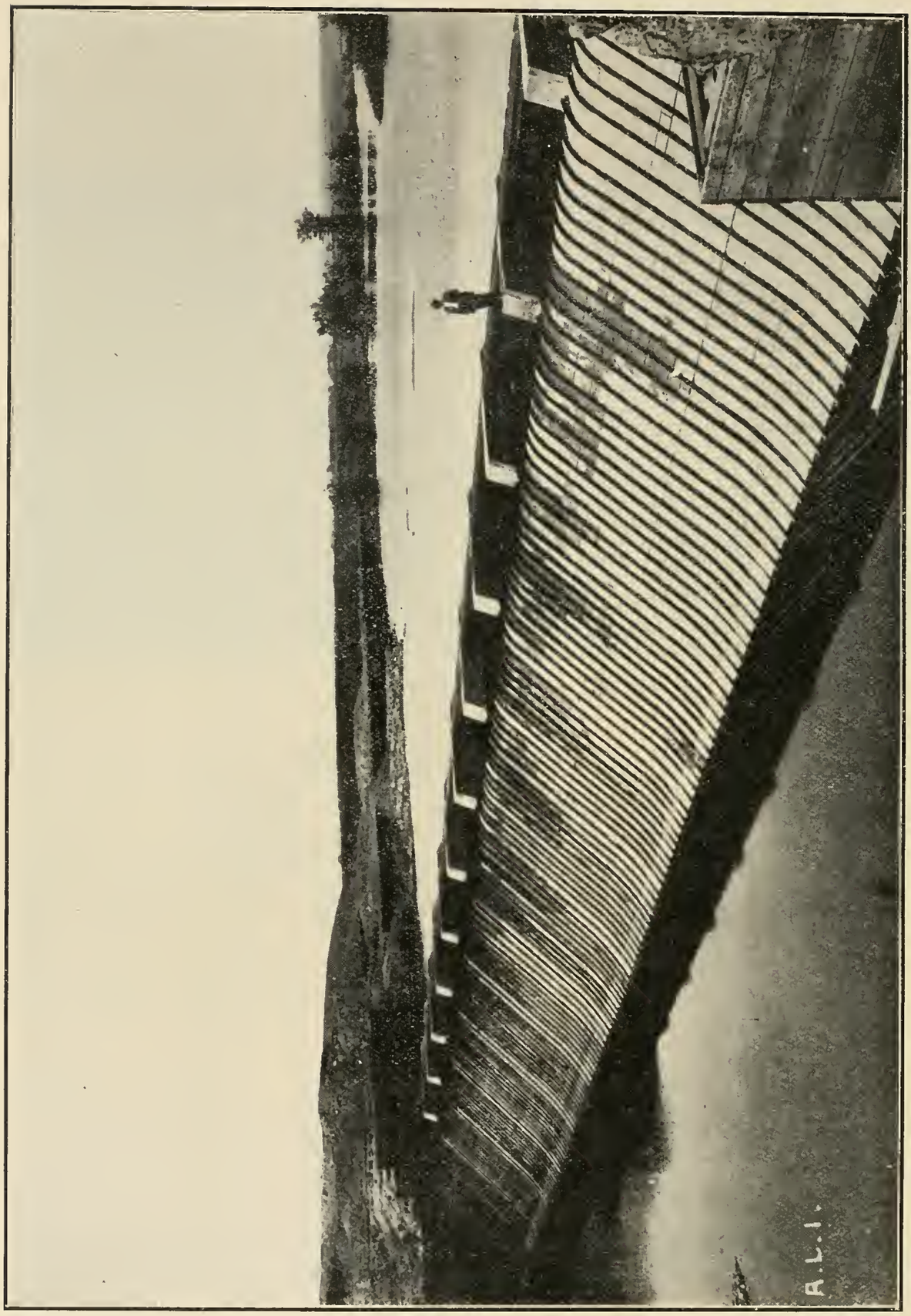
THE MILK RIVER PROJECT.

Investigations were made by the Reclamation Service as to the feasibility of the diversion of St. Mary River into Milk River and its use, together with the waters of Milk River, for the irrigation of the arid lands of the Milk River Valley in Montana, and as a result of such investigations, in August, 1902, about 1,000,000 acres of this land were withdrawn.

A diversion dam has been constructed across the Milk River at Dodson and the Dodson South Canal is completed for a length of 9½ miles and distributing canals finished for the delivery of water to about 8,000 acres of irrigable land.

The soil is of such depth and character that one thorough irrigation in the early Spring is usually sufficient to produce valuable crops and if the distributing canals could be constructed in the immediate future the revenue from the flood water of Milk River so diverted will assist in carrying forward the necessary diversion of the water of St. Mary River for the permanent irrigation of lands included in the entire system.

The irrigation plan of this project provides for the utilization of the water of St. Mary River in conjunction with the waters of Milk River by means of a storage reservoir developed by constructing a dam across the St. Mary River near the outlet of lower St. Mary lakes on the Blackfeet Indian Reservation, and the conduction of the stored water 26 miles by canal to the Milk River drainage basin, and diversion dams in the



Dodson Dam. 380 feet long. Milk River Project, June 29, 1910.

Milk River near Chinook, Dodson and Vandalia, Montana, for diverting water into canals covering lands in the Milk River Valley.

The Chinook dam will divert water from Milk River into two canals, one on either side of the river, for the irrigation of 100,000 acres of land near Chinook and Harlem, Montana, comprising the Chinook Unit.

The Dodson dam will also divert water for the irrigation of 130,000 acres of land on both sides of the river near Dodson, Malta, Saco and Hinsdale, Montana, and the Vandalia dam will divert water on the south side of the river for the irrigation of 20,000 acres of land near Glasgow, Montana, comprising the Glasgow Unit.

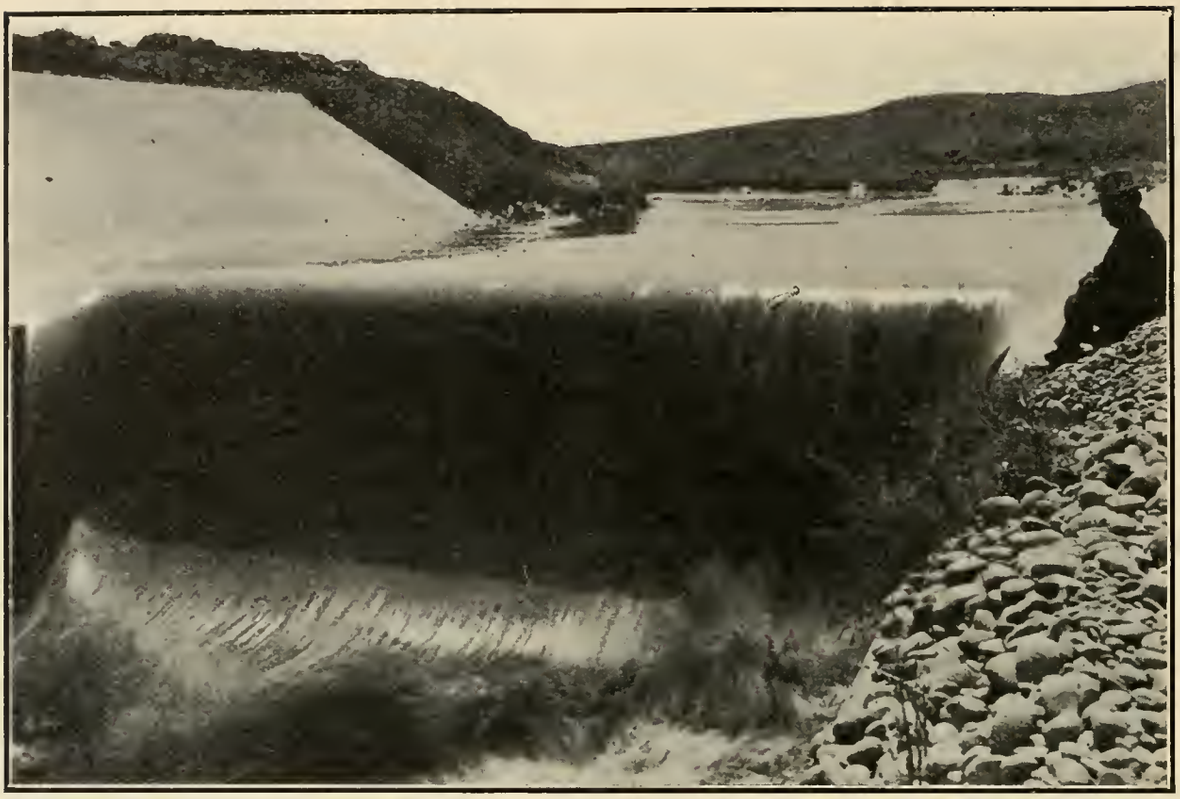
Other than school sections 16 and 36, the State controls no large bodies of land here, and the Great Northern Railway, which traverses the project, has no lare holdings as it had no land grant. The public and private lands in the district are about equal in area.

The value of irrigated land at present ranges from $35 to $100 per acre. The range of altitude for the project is from 2,000 feet in Glasgow to 2,400 feet above sea level at Havre. The average yearly precipitation is about 13 inches.

Most of the soil in the Milk River Valley is a sandy loam well adapted to the raising of grains, hay and vegetables. In some sections a heavier soil is found. This soil is fertile and with thorough cultivation can be made to produce excellent crops. At present a few small private canals in the vicinity of Chinook and Harlem are operated and some ranchmen have installed temporary pumping plants taking water from Milk River with lifts of 15 to 25 feet. Fifty to sixty horsepower boilers and engines with 10-inch centrifugal pumps are often used. Local coal for operating these plants costs about $3.50 to $4.50 per ton at the nearest railroad station.

The raising of alfalfa is increasing and two cuttings and a grazing crop are produced annually. Alfalfa seed is a profitable crop, the yield on the average being 8 bushels per acre and the selling price $7 per bushel. A native grass known as blue joint yields from 2 to 3 tons of hay per acre, the current price for which averages about $10 per ton in the stack. Oats are extensively and successfully raised, the price ranging from $1.30 to $2 per hundred pounds. Wheat produces well but is not extensively raised as no flour mills have been established in this locality. Good crops of potatoes are raised, an average yield being 200 bushels per acre. Onions, pumpkins, cucumbers, cabbage, lettuce, tomatoes, beans, and peas are raised successfully. Experiments show that sugar beets may be profitably raised, but no sugar factories have been established.

It is expected that there will always be a good market for forage crops in the Milk River Valley, as extending southward 60 miles to Missouri River, and northward 40 miles to the Canadian boundary line is one of the finest range sections in the Northwest.



Drop in Pryor Creek Drainage Canal. Huntley Project, May, 1909.

THE HUNTLEY PROJECT.

The Huntley Project covers those lands in Yellowstone County extending in a compact body from Huntley to Bull Mountain on the south side of the Yellowstone River. The lands are crossed by the Northern Pacific Railway and Chicago, Burlington & Quincy Railroad. These two railway unite at Huntley, about thirteen miles east of Billings. The average elevation of the irrigable lands is about 3,000 feet.

The headworks of the main canal are located about two and one-half miles west of Huntley. From the headworks to Huntley the canal is carried through three tunnels aggregating 2,650 feet in length and along the bluffs adjacent to the Northern Pacific Railway. From these the canal follows the general direction of the Chicago, Burlington & Quincy Railway to about three miles from Ballantine.

Two drops were located in the canal, one about one mile east of Ballantine and the second about four miles. The possible power at the second drop has not as yet been utilized. At the first a pumping plant is installed. The power for pumping is developed due to the 34 fee t drop in the main canal at a point 14 miles below the headgates, and with this power 56 second-feet of water are elevated 45 feet by two centrifugal pumps, the water being pumped into the high line canal on the Ballantine bench and extends to the lands along Fly Creek, irrigating about 4,000 acres. The plant has been in operation through three seasons and its efficiency, reliability and success have been thoroughly demonstrated.

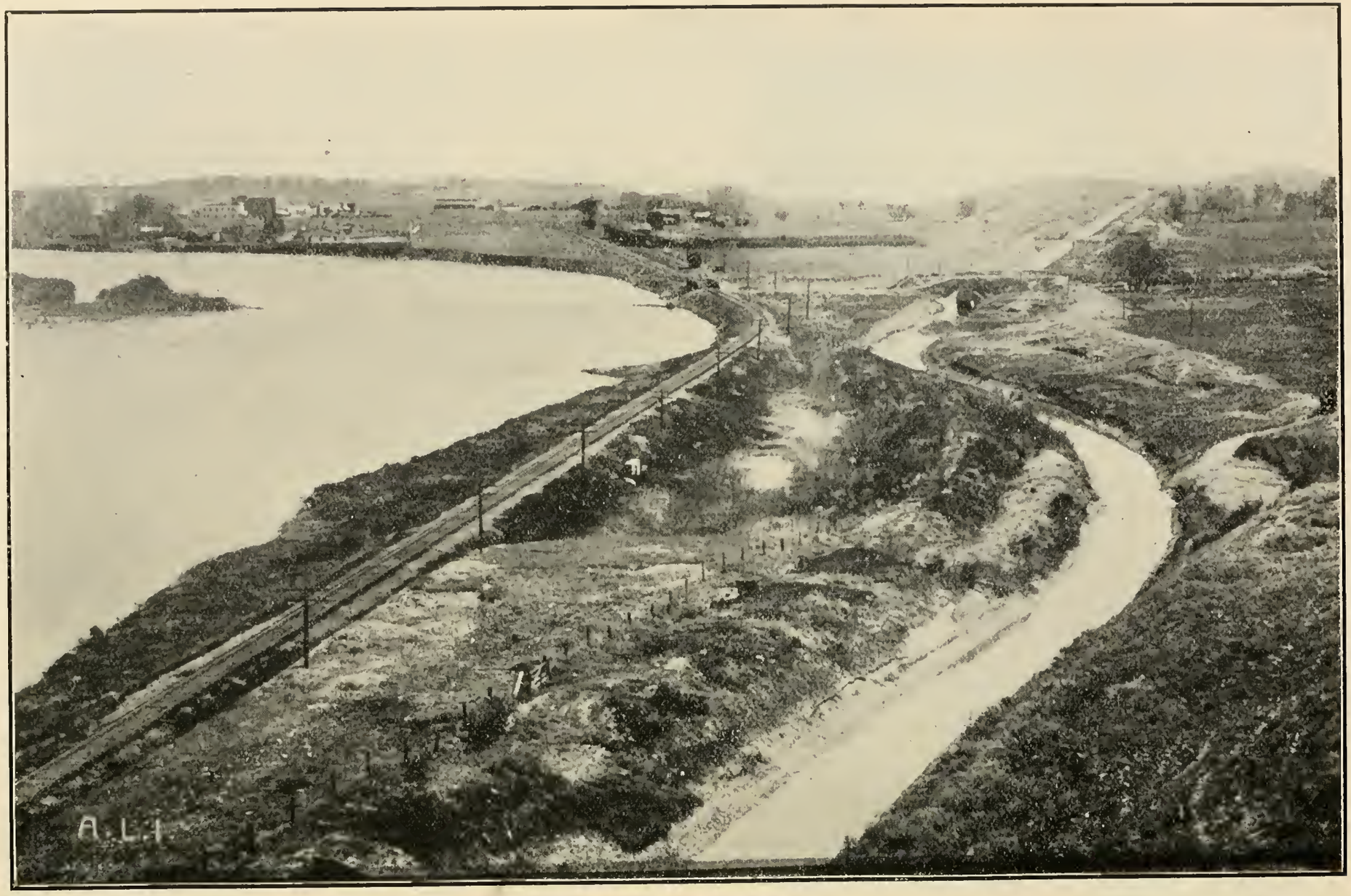
From the pumping plant the main canal runs easterly in a general way paralleling the line of the Northern Pacific Railway. This canal at present extends to Lost Boy Creek, where a temporary wasteway has been provided. The main canal to this point is 23½ miles long, while the length of the high line canal is 6½ miles. Surveys have been made for the extension of the main canal to Bull Mountain, about eight miles, and of the high line canal along Fly Creek Valley, about nine miles. The extension of the main canal to Bull Mountain will be completed in 1911 and will add tbout 5,000 acres of irigable land to the project.

The lateral system was constructed so that water is delivered to the margin of each farm unit, and the various turnouts, culverts, bridges, etc., required for the operation of the system, as well as waste water ditches and public roads, were constructed and opened. If the settlers refrain from excessive use of water the waste water ditches will prevent the outlying lands becoming water logged. One hundred and sixty miles of lateral ditches and sixty-five miles of waste water ditches were constructed and the works so constructed have already developed about 29,000 acres of land, about four-fifths of which has already been homesteaded.

The lands under the project, not included under the Bull Mountain extension, were subdivided into 585 farm units and in laying these out the policy was to give each settler at least 40 acres of irrigable land and to include with the irrigable land such pasture or woodland as could be found adjacent. The farms thus contain from 40 to 160 acres of land, of which 40 to upwards of 100 acres are irrigable. In many cases fractional lots containing less than 40 acres were joined with adjoining lots, thus bringing the total irrigable land in some of these farms up to 60 or 70 acres. The larger farms are those lying along and extending across the main canal and along the Yellowstone River.

A careful study was made of the resources and conditions affecting the farms in the Yellowstone Valley before deciding on the 40-acre farm unit policy. It will be noted that the railroad connections and facilities for shipment are very good. A house to house canvas of farmers on irrigated lands near Billings showed that a good living is being made on 135 farms with irrigable areas not to exceed, and in many cases less than, 40 acres. The building of a beet sugar factory at Billings and the establishment of a creamery at that point, together with the general development on this part of the State were further reasons for the size of farm unit adopted.

The Huntley Project was formally opened on June 26, 1907, in the presence of the Secretary of the Interior, the Senators from Montana, the Director, Chief Engineer and Supervising Engineer of the Reclamation Service, Government and railway officials and people to the number of seven or eight hundred. Up to July 1, 1910, 441 of the farms thrown open for entry had been filed on, the entries had been made and the lands were under cultivation. There still remain open for settlement on this



Main Canal. View looking down Canal from heading towards town of Huntley. Huntley Project, May 19, 1909.

project about 140 farm units with a total area, including grazing land, of 6,620 acres.

Before the subdivision of the farm units had been made it was decided to have a townsite every five or six miles on the two transcontinental railroad systems. The two railroads involved gave their hearty cooperation and have erected stations and put in switches and passing tracks at the townsites selected.

Following the general policy of the Service, the townsites Huntley, Osborn, Worden, Ballantine, Newton, Anita, Pompey's Pillar and Bull Mountain were laid out. Huntley and Osborn are on both railroads, Ballantine and Anita are on the Chicago, Burlington & Quincy Railroad and the remaining townsites are on the Northern Pacific Railway. All are in Yellowstone county.

The settlers on the Huntley Project were and are required to make a first payment of $4.60 per acre. This is made up of a first payment against the cost of construction of $3.00 per acre, based on an estimated cost of $30.00 per acre, for the construction of the system, and a first payment of $1.00 per acre of the total $4.00 per acre due under the Act of April 27, 1904, to the Crow Indians, and 60 cents per acre, the estimated charge for maintenance for the first year the system is in operation. The settlers will have to pay the building charge of $3.00 per acre each year for ten years and 75 cents each year for four years, for the Indians, but the maintenance charge may be reduced if the costs warrant.

The total cost to the settler of the irrigated portion of these lands, including maintenance and operation for ten years, will probably be about $40.00 per acre, the deferred payments without interest making the present worth cost only about $25 per acre. In regard to these payments it should be also noted that the land is exempt from taxes during the time of payments.

Practically all the produce raised along the Yellowstone River in and near Billings is consumed in the local markets of that place, and the supply of many of the crops is not sufficient to meet the local demands. A creamery has been in operation in Billings now for some time, but they have not been able to supply the local market with butter, and as the local market is increasing rapidly it will be some time before there will be any dairy products that could not be disposed of at that point.

The majority of the farmers along the Yellowstone River in the vicinity of Billings say that alfalfa hay pays better than grain crops, and nearly all are of the opinion that diversified farming will be more profitable than straight hay or grain.

All necessary betterment work was done on the distributing systems after the first season's operation and before commencing delivery of water in the season of 1909, and an ample supply of water was delivered to each farm unit. Measuring weirs are being installed in all laterals and at each farm turnout. A record is being kept of the amount of water used on each variety of crop and valuable data as to duty of water will be available at the close of the season.

Many of the settlers on the project have come from the middle west and were inexperienced in irrigation methods, but they have quickly adapted themselves to the new methods of farming and are getting satisfactory results.

The farmers have organized a farmer's club with 185 members for mutual improvement and cooperation in the growing and marketing of crops. This organization held its first annual fair at Huntley on September 2, 1909; and exhibits were sent to the state fair at Helena, and to the dry farming congress at Billings.

Preliminary reports show a great variety of crops being raised and a tendency toward intensive farming. The condition of crops on the project is satisfactory. Over ten thousand fruit trees have been set out, also a large number of shade trees.

Practically all of the farmers throughout the project are well satisfied with their results under the existing conditions and it is also a point well to be noted that they agree that the 40-acre farm is the right size farm for this locality and it is their unanimous belief that if properly farmed it will yield a profitable income to the farmer.

D. Lateral looking towards Square Butte showing irrigation Land under Sun River Project, June 23, 1910.

THE SUN RIVER PROJECT.

The Sun River Project, a portion of which, 16,000 acres, is already open to entry, is located a little west of the center of the State, lying in Teton, Lewis and Clark, Chouteau and Cascade counties. The irrigable lands and structures of this project are comprised within the area

between the Rocky Mountains on the west, Missouri River on the east, include Sun River on the south, and extend to the Teton River on the north. The project takes its name from the Sun River from which stream it obtains water for irrigating the lands. The Sun River rises in Lewis and Clark National Forest and the present supply of water based on the minimum flow of the river will, when the three large and several small reservoirs contemplated are finished, be ample to irrigate upwards of 300,000 acres.

The first portion of the Sun River Project, for which irrigation works have been completed, is a tract of 16,000 acres formerly the Fort Shaw Military Reservation. The bill opening the abandoned reservation to settlement was approved June 9, 1906, and preliminary canal surveys were made during the following summer. Construction work began in the summer of 1907 and water was turned on in June, 1908. This system consists of twelve miles of main canal, 66 miles of laterals and 17 miles of waste water ditches, with the necessary structures to control the water and deliver it at the margin of each farm unit. The waste water ditches were excavated to prevent water logging of the lower lands through the inexperience of the farmer.

There are 206 farm units, the smallest being 40 acres and the largest 168 acres. The smallest area irrigable on any farm is 25 acres and the largest irrigable area is 115 acres. The average size of the farms is 88 acres, of 61 acres is the average irrigable portion.

These farm units were carefully laid off to equalize the value of different farms as nearly as possible, and the intention has been to give in connection with the irrigable area as much pasture land, up to a total of 160 acres, as circumstances would allow.

The terms of payment announced by the Secretary of the Interior, are that the construction cost repayable is $30 per irrigable acre, divided into not less than five nor more than ten annual payments, that $3 per acre of this must be paid to the land office on making application for filing; also that the operation and maintenance cost is 50 cents per acre for the irrigable season of 1909, for which year the first building charge will be applicable. No charge was made for any water delivered in 1908. The second installment of the building charge was payable May 1, 1910.

All the crops that can be grown in northern countries can be grown here, but the principal crops will undoubtedly be alfalfa, alfalfa seed, grain, sugar beets, potatoes and other roots and cereals. Alfalfa furnishes three cuttings each season and the average yield for the three cuttings is about five tons per acre. All small fruits do well in the Sun River Valley.

A 40-acres demonstration farm is being conducted adjacent to the town of Simms. The whole tract is in cultivation, the crops planted consisting of oats, wheat, field peas, millet, potatoes, sugar beets and vegetables. The State Nursery Company, of Helena, and the Missoula Nursery Company donated a number of apple and plum trees. Of these

about 70 were set out at Simms and 35 at Fort Shaw, and all but about half a dozen are in thrifty condition. Broad-leaf cottonwoods have been planted on two sides of the demonstration farm and around the buildings at Simms and Fort Shaw.

An assistant superintendent of irrigation has charge of operations at the demonstration farm, and gives advice to the settlers, aiding them in planning their farm distributaries and leveling their fields, advising as to time and amount of irrigation and otherwise assisting them in becoming acquainted with local conditions and requirements.

The Great Northern Railway traverses this project. The nearest station to the Fort Shaw Unit is Vaughn, which is about seven miles distant from the nearest irrigable lands. There are four other stations along this line of the project, viz: Steel, Power, Dutton and Collins. The United States land offices are located at Great Falls and at Helena, Montana. Applications for homestead entries and water-right may be filed at either of these offices.

A new railway has been projected by the Great Northern Railway Company from Vaughn running west up the Sun River Valley and from there by the main river route to Augusta, passing through the project. Grading on this line was begun in the summer of 1910, and much of the right of way has been obtained.

Throughout the whole project the farm village idea will be carried out, and these will be established at intervals of about six miles. With the settlements already started and those selected for future growth there will be some twenty of these small towns. Those now located on the Fort Shaw Unit are Fort Shaw and Simms.

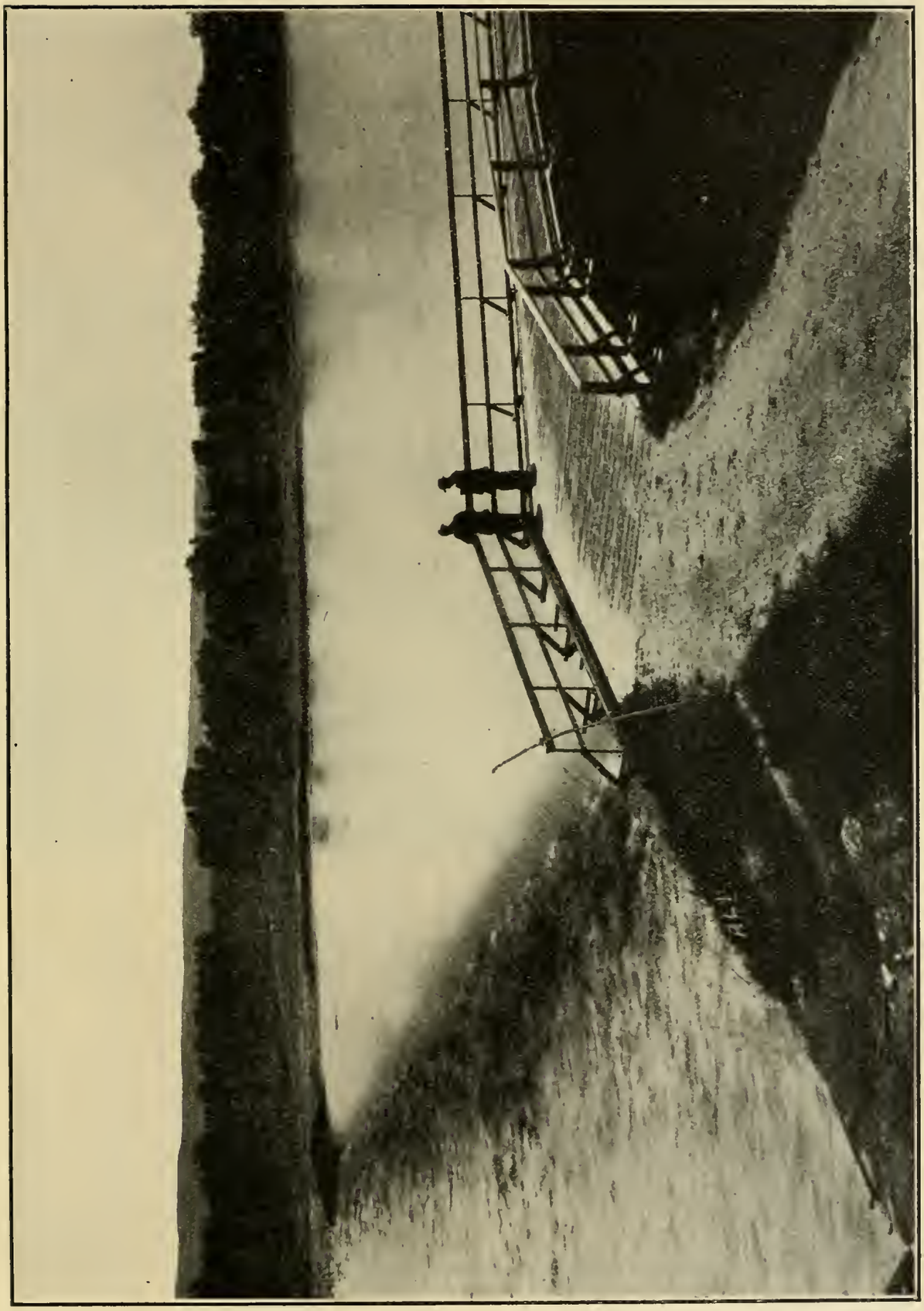
In connection with the Sun River project thirteen reservoir sites have been surveyed and four of them will be used to supplement the waters of Sun River. There has been in the process of construction for some time a dam on Willow Creek which will create a reservoir covering 2,885 acres and will impound water sufficient to irrigate 42,000 acres of land.

One of the features of the general Sun River project will be the diversion of Bowel Creek in Flathead County on the west side of the Rocky Mountains so that its waters are diverted to the Atlantic slope on the east side of the mountains.

In the Fort Shaw Unit of the Sun River Project the water is delivered to the margin of each farm and no lateral canals were necessary. The lay and slope of the land is such that almost all of the canal system is located on land subdivision lines, which obviates the cutting of farm units into irregular tracts.

THE LOWER YELLOWSTONE PROJECT.

The first investigations of the Lower Yellowstone Project were made in July, 1903, and from the surveys carried on plans were prepared during the winter of 1904 and 1905. The construction of the project was authorized May 10, 1904, and construction work was begun in June, 1905,



Lower Yellowstone Dam, 700 feet long, 12 feet high, 22,000 cubic feet of water passing over at this time, July 6, 1910.

on the first sixty-four miles of the canal .

The lands under the project border the Yellowstone River in Dawson County. The headworks of the main canal are seventeen miles below Glendive. On the project there will be susceptible to irrigation about 67,000 acres of land.

The Yellowstone River at its lower course has eroded a broad valley and built up a series of level or gently sloping terraces. These terraces vary in width from one-half mile or less at the southern or upper end of the project to four or five miles in its broadest position. There are generally two well defined terraces, the height varying from four or five to fifty or sixty feet. On account of its elevation above the river and a good slope riverward, which generally characterizes the surface of the upper benches, the soil is well drained. The soil throughout nearly the entire project possesses almost exhaustless fertility, and probably few areas of equal size could be found in the irrigable districts in the west where the land will require so little clearing and grading to prepare it for the application of water. The surface is generally smooth and gently sloping with about the desirable fall for easy irrigation.

The Lower Yellowstone Project is surrounded by one of the largest and best grazing regions in the United States, which makes it especially well located for the new settler who might wish to grow forage crops, for which there is a ready local demand at good prices. The local conditions of soil, climate and transportation are adapted to the growth of alfalfa and at least two heavy crops may be cut each season. Wheat, oats, barley and flax do well, as do most of the ordinary garden vegetables.

The canal system for the intended irrigation of the area now susceptible to irrigation has an operation force consisting of an Irrigation Manager, with headquarters at La Mesa, 14 miles down the river from the headworks and diversion dam, assisted by three District Superintendents of Irrigation. The project is divided into three lateral districts, each having 60 to 70 miles of canals and laterals and about 20,000 acres' of irrigable land. The canal system operated throughout the season of 1909 was put into commission for the season of 1910 on May 28 and shut down October 11.

Water rights have been initiated by land owners on 13,195 acres of irrigable land.

Notwithstanding the lack of irrigation experience on the part of the land owners, the crops grown on irrigable lands during the past two seasons have been fair,—wheat yielding from 20 to 30 bushels to the acre and oats 40 to 60 bushels to the acre, while non-irrigable land in the farming season of 1910 in the vicinity yielded on an average of about 5 bushels to the acre. A small acreage under the project has been seeded to alfalfa, and he growth appears to be satisfactory. The area devoted to this crop will doubtless rapidly increase. Three crops of alfalfa were harvested in 1910 with a total for the season of over 5 tons in many instances.

At present the Lower Yellowstone project has transportation at Glendive, on the Northern Pacific Railway, and at Mondak, on the Great Northern Railway. The Missouri River Railway Company, a subsidiary of the Northern Pacific Railway Company, has nearly completed grading on the first 50 miles of its projected water grade railway line from Glendive via Sidney and the Missouri River to Mandan, North Dakota.

Several new towns have started up on the project along the new railway line and it is expected the track will be laid and trains running into Sidney in time to move the crop of 1911.

Main Lower Yellowstone Canal from Sears Creek Bridge looking South July 12, 1910.

There are about 20 farm units of public land now open to homestead entry and several thousand acres of land in private ownership which are held in areas in excess of the 160-acre maximum on which a single individual may perfect a water-right under the Reclamation Act. These private lands are held for sale at prices from $15 to $30 per acre, subject to the terms of the Reclamation Service public notice of December 21, 1908, which provides for repayment of the building cost of the project at the rate of $42.50 per acre in ten annual installments, without interest. The operation and maintenance charge is fixed at $1 per acre per annum.

THE ST. MARY PROJECT.

This project is located in the extreme north-central part of the State in Teton County. The principal railroad connection is at Browning, Montana, on the Great Northern Railway. The general land office of this district it at Havre.

The St. Mary Project is considered a feature of the main Milk River Project. The design as at present developed is to store the flood waters of the St. Mary basin and conduct them by means of a canal 26 miles long to the headwaters of the Milk River. The waters thus diverted into Milk River pass northward into Canada and back again into the United States near logitude 111 west. To provide for the equitable distribution of the waters of the St. Mary River and Milk River, a treaty was entered into between the United States and Great Britain, proclaimed May 13, 1910, providing, among other things, as follows:

St. Mary's Lake, Glacier Park.

"It is further agreed that in the division of such waters during the irrigation season between the 1st of April and 31st of October, inclusive, annually, the United States is entitled to a prior appropriation of 500 cubic feet per second of the waters of Milk River, or so much of such amount as constitutes three-fourths of its natural flow, and that Canada is entitled to a prior appropriation of 500 cubic feet per second of the flow of St. Mary River, or so much of such amount as constitutes three-fourths of its natural flow.

The channel of the Milk River in Canada may be used at the convenience of the United States for the conveyance, while passing through Canadian territory, of waters diverted from the St. Mary River."

It is proposed to build a low storage dam about three-quarters of a mile below the present outlet of Lower St. Mary Lake. From the res-

ervoir thus formed water will be diverted through a tunnel 1,100 feet long in the right bank of the river. The canal proper, with a bottom width of 27 feet, will begin at the end of the tunnel. At certain stretches of the canal where it passes along the St. Mary River, the section is materially changed and in places the sides and the bottom will be concrete lined.

The construction of this canal has been carried on for the past four years on a small scale, a steam shovel and an excavator having been in operation. Work is now in progress, and about 400,000 cubic yards of material have been excavated.

Indians working on Main Canal, Two Medicine Unit, Blackfeet Indian Reservation.

BLACKFEET INDIAN RESERVATION PROJECT.

Preliminary investigation and surveys made in the fall of 1907 demonstrated the possibility of five irrigation systems on the Blackfeet Indian Reservation, and of these the Two Medicine system, which will irrigate about 45,000 acres, owing to the excellent water supply and storage facilities, proved the most feasible. The principal work has been devoted to this unit, which is now being constructed.

The Two Medicine Unit is located in the east-central portion of the Blackfeet Reservation. The main canal heads just below the confluence of Little Badger Creek with the Two Medicine River and continues in a northeasterly direction to the irrigable areas which are on the west slopes of Cut Bank Creek. This tract has an area of over 70,000 acres and extends about 15 miles along the creek with an average width of

about six miles and contains about 45,000 acres of irrigable lands of which about 20,000 acres are under the main canal and about 25,000 acres under a south branch canal. The lands under the main canal are contiguous to and directly west of the town of Cut Bank, and are bisected by the Great Northern Railway.

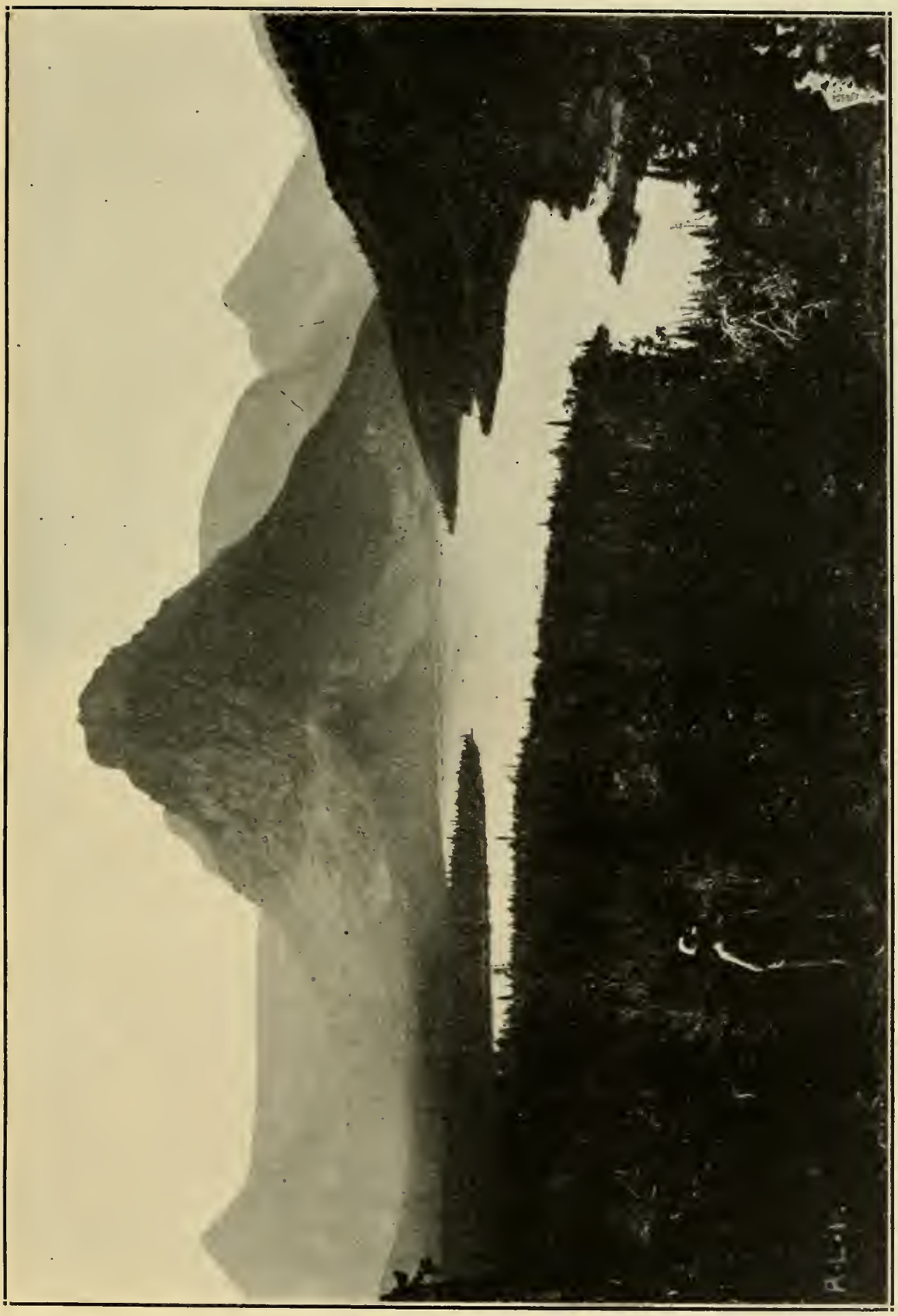
Final surveys fortheTwo Medicine Unit were begun in the spring of 1908, continued throughout the field season, and resumed in the spring of 1909. Fifty-six miles of preliminary and final location of main canals have been made and cross-sectioned, and about 60 miles of location of lateral canals have been completed, over one-half of which has been cross-sectioned, and topographic surveys and maps covering an area of 140 square miles have been made.

Construction of the main canal was begun in the latter part of July, 1908, and was suspended for the winter early in December. Work was resumed about May 1, 1909. Two miles of main canal have been completed and three miles have been about 70 per cent completed. Cross-drainage culverts and flumes have been erected on the first 18 miles of canal. There have been built 32 miles of telephone line, a headquarters camp of 10 temporary buildings, a division camp for engineers of 4 temporary buildings, 2 construction camps, one of 7 and one of 8 temporary buildings, and 5 miscellaneous temporary buildings for use as storehouses, stables, etc. To facilitate hauling, some work has been done on the roads, including the building of several bridges.

Practically all of the irrigable land is of an excellent grade of brown sandy loam, underlaid with gravel at from one to four feet below the surface. Without water the lands produce excellent hay and pasturage, and with irrigation especially good hay and alfalfa and good yields of grain and potatoes.

The topography is such that the land can be irrigated with little leveling work; all of the irrigable lands are free from greasewood and other brush or timber.

Preliminary construction surveys were started on May 1, 1908, and construction work started in July of the same year. It is expected that the system will probably be completed and ready for irrigation in the fall of 1911. The Two Medicine Unit is about 35 per cent completed and in 1910 thirty-two Government and 178 Indian teams have been been employed on the work with the necessary complement of laborers.



Upper Two Medicine Lake Reservoir Site, August 28, 1909. Blackfeet Project.

Lake McDonald Showing Character of Timber, Flathead Project, August 18, 1909

FLATHEAD INDIAN RESERVATION PROJECTS.

Between the Continental Divide on the east and the Bitter Root Mountains on the west in the western-central part of the State, in Flathead, Sanders and Missoula counties, is the Flathead Indian Reservation. In this Reservation there are about 150,000 acres of land susceptible of irrigation which, when irrigated, is well adapted to grain, alfalfa, apples, cherries and all small fruits, and this land comprises the Flathead Project.

For the irrigation of these lands water will be taken from the Jocko River and several creeks rising in the Mission Mountains, ample flow being assured for the irrigation of the majority of the land by gravity by utilizing the storage reservoirs which will be formed of lakes St. Mary and McDonald, and other natural basins supplemented by the pumping from Flathead Lake by power to be developed along the Flathead River.

Reconnaissance surveys were begun in 1907 and work is now being prosecuted on those tracts where the development is the simplest| Portions of these canal systems covering 12,000 acres were completed in the spring of 1910. The Northern Pacific Railway traverses the reservation and the stations on its line are Evaro, Arlee, Ravalli, Dixon and Parma. The north end of the irrigable area has transportation outlet by boats on Flathead Lake to Somers, where connection is made with the Great Northern Railway. A railway has been surveyed from Somers on the

Great Northern Railway to Dixon on the Northern Pacific Railway and will probably be constructed before the irrigation works are completed.

FORT PECK INDIAN RESERVATION PROJECT.

Investigations are now being carried on throughout the reservation in order to determine those tracts susceptible of irrigation, also to determine the method of watering the lands. A gravity supply can be obtained from the Missouri River, diverting at old Fort Peck. Deposits of lignite throughout portions of the reservation make feasible pumping projects in their vicinity, and it is probable that several different projects will be found on the reservation. Storage reservoir sites have been located on Porcupine, Box Elder, Poplar and Big Muddy streams.

The Fort Peck Project contemplates the irrigation of land on the Fort Peck Indian Reservation to the amount of 144,000 acres, divided into units as follows:

Missouri River Gravity Canal	94,000
Big Porcupine Unit	4,000
Little Porcupine Unit	2,000
Poplar River	28,000
Big Muddy River	16,000

with a possible irrigation by pumping from the Missouri River Gravity Canal for 10,000 acres of pulbic land just west of the Reservation and known as the Galpin bottom.

Hay and grain are the principal crops, but require irrigation. Vegetables grow exceedingly well with sufficient moisture.

The land is free from brush and is mostly gumbo of good quality. It has a slope of about 1½ feet per mile and lies conveniently for dyke irrigation. Practically all the land under the gravity canal has been allotted to the Indians.

The lands under this project (now Indian Reservation) are all easily accessible to towns on the Great Northern or its branch line recently completed through the east end of the réservation.

The work is being done by the Reclamation Service, but from moneys appropriated for the office of Indian Affairs. The work is being carried on by Indian labor and Indian teams. During part of the year 1910, at times there were employed on the various units under construction as many as 485 men and 100 to 175 teams.

COST OF LAND AND PAYMENTS.

In selecting a public land farm unit for entry on any of the Reclamation Service projects, the settler may choose any farm as subdivided by the Secretary's announcement still vacant at the time of his application, but he may not choose the particular areas to comprise that farm. He must live five years upon the land before making proof, as the reclamation laws do not allow commutation and the cash payment in eighteen months. Soldiers are credited for their term of service under the Homestead Law. The land will cost the settler nothing except on projects constructed on ceded Indian lands, as the Huntley, Flathead and Fort Peck projects;

also excepting the land office fee for filing and making proof. He repays to the United States only the actual cost of putting water upon the actual number of irrigated acres in the farm. The acreage irrigable in each farm has been carefully determined to the nearest acre and the irrigable and non-irrigable portions of each farm are shown on the plats filed in the land office; thus every person known definitely at the start upon how many acres he will have to make water repayment.

Under these terms the early settlers are allowed nearly two years before the second payment is due, thus giving them opportunity to get their land in shape and letting it earn its own repayment. Maintenance charges should be materially less than those ordinarily paid under systems heretofore constructed on account of the permanency of the Reclamation Service works.

As an example regarding repayments, suppose the farm has 26 acres of irrigable land and, as on the Sun River Project, the construction charge is $30 per acre and the maintenance charge is 50 cents per acre, the first payment will be $78 for construction charge and $13.00 for maintenance and operating charge, a total for the first year of $91.00.

While the first cost of water right for the Reclamation Service projects has to some seemed at times large in comparison to the charges on private systems, it must be borne in mind that on these Government projects water is delivered to the margin of the farm and only the actual leveling of the ground is necessary by the settler; then also the land is exempt from taxes, and there is no interest charged by the Government on future or deferred payments, the cost of these lands being absolute and cannot be varied from the first cost as assigned by the Secretary.

It is a curious but positive fact that with a water-right charge of $30.00 per acre on a Reclamation Service project, one can by making a deposit of $23.10 per acre in about any National Bank in the State, and with the accumulated interest make his ten annual payments of $3.00 each from same, so that the actual cost of land would be $23.10 per acre.

FARMING THE PROJECT LANDS.

The crops under irrigation on the farms of Reclamation Service projects for the season of 1910 made a remarkably good showing. On the Huntley project about all the settlers succeeded in getting a portion if not all of their lands plowed and planted in time to raise a crop. The principal crops have been sugar beets, alfalfa and grain, of which wheat and oats predominated. Sugar beets average upwards of 2 tons per acre for which the settler receives an average of about $6.00 per ton. Wheat reached 35 bushels to the acre and oats as high as 70 bushels to the acre. Garden truck of all kinds did well, although the season was somewhat late. Other very good yields were made in alfalfa, onions, beans and potatoes. Tomatoes, corn, cabbage, cantaloupes and turnips made a very good showing on the projects, and taken as a whole the farmers are very enthusiastic over their prospects.

Even with the good showing made the best results were not ob-

tained, this being due to the inexperience in irrigation on the part of the settlers being men who have never done any farming and men who have had little experience as farmers, but in sections of the country where irrigation is hardly known.

It has been the practice in certain instances to plow up a whole farm or a large portion of same and sow it to wheat, oats alfalfa without clearing off the sage brush entirely, and without leveling the land to any extent, so when water was turned on the crops were either flooded or received no water at all. Many of what might have been very good crops were injured by the application of too much water or not enough and the lack of proper distributing ditches on their own farm units.

An example showing what a forty-acre irrigated farm will do is as follows: Forty acres of alfalfa at a minimum would be worth $25.00 per acre gross and cost $7.50 to put it up if wages were paid for the work, which would be $1,000 gross or $700 net. If the alfalfa hay were fed stock these returns could be nearly doubled. At the State Experiment Station 900 pounds in live weight on steers has been obtained from one acre of pasture seeded to clover. This at 3½ cents per pound would be $31.50 per acre, or $1,360 for forty acres. It has been demonstrated at the Experiment Station that beets are worth nearly as much to feed to hogs as they are to sell to sugar factories.

WATER USERS' ASSOCIATION.

The Reclamation Act provides that when the major portion of the payments required by the Act are made for the lands irrigated, the management and operation of such irrigation works shall pass to the owners of the lands irrigated, thereafter to be maintained at their expense under such form of organization and under such rules and regulations as may be acceptable to the Secretary of the Interior.

After the preliminary surveys have been made and the construction of a project has been favorably decided, the very first work undertaken is the formation of a Water Users' Association. Books are opened and all owners of land under the project are invited to sign an agreement or contract with the Government in effect that, in the event of the work being completed, the owners will pay to the Government the actual cost of such construction, together with a yearly charge for maintenance until such cost has been fully repaid, whereupon the plant will become the exclusive property of the association. Shares are issued to the members as their personal property in amounts which correspond to the acres of land owned, but which are inseparably associated with that particular acreage. The constitution and by-laws prescribe how the business of the association shall be conducted, and for regular officers and meetings. The actual cost of administration and maintenance is secured by an assessment levied on all shares and delinquent payments are collected through a public sale of such portion of the land as may be necessary to cover them and attendant costs of such sale.

FORCE ACCOUNT WORK.

In construction work on Government reclamation projects both contract and force account systems are used. The "Force Account" as it is called, is simply taking direct charge by employing men and teams by the day or otherwise, and buying and using tools and implements the same as would a private individual. In a number of cases it was impossible to secure advantageous bids from contractors, therefore the Government undertook the work itself, placing its engineer in charge, purchasing all the equipment necessary and made it a point so far as possible to give employment to the actual settlers on the project.

CAREY LANDS.

The state of Montana has made considerable progress toward securing the one million acres of land granted to each of the arid and semi-arid states under the Carey Act.

Segregations under this Act have been asked for as follows:

List Nos. 1 and 7, near Billings	15,378.11 acres
List Nos. 2, 3, 9 and 11 near Big Timber	32,647.83 acres
List Nos. 5 and 6, near Augusta (Dearborn Project)	36,536.42 acres
List Nos. 8, 12 and 14, near Valier	102,898.27 acres
List Nos. 10, near Bynum	134,987.42 acres
List No. 13, near Martinsdale	20,308.87 acres
List No. 16, near Sheridan	22,285.96 acres
List Nos. 17, 19 and 21, near Flatwillow	84,447.98 acres
List No. 18, near Lima	7,885.52 acres
List No. 22, near Ericson	19,644.97 acres
List No. 15, near Lavina	5,142,30 acres
Total acreage	482,163.65

Of this area a large part is pending before the Department at Washington for approval. Of that part already approved by the Commissioner, a large area has already been fully reclaimed by the State.

The most advanced of these are list Nos. 1 and 7, the Billings project, (under contract with the Billings Land and Irrigation Company); List Nos. 2, 3, 9 and 11, the Big Timber project, (under contract with the Glass-Lindsay Land Company) and List Nos. 8, 12 and 13, the Valier project (under contract with the Conrad Land and Water Company).

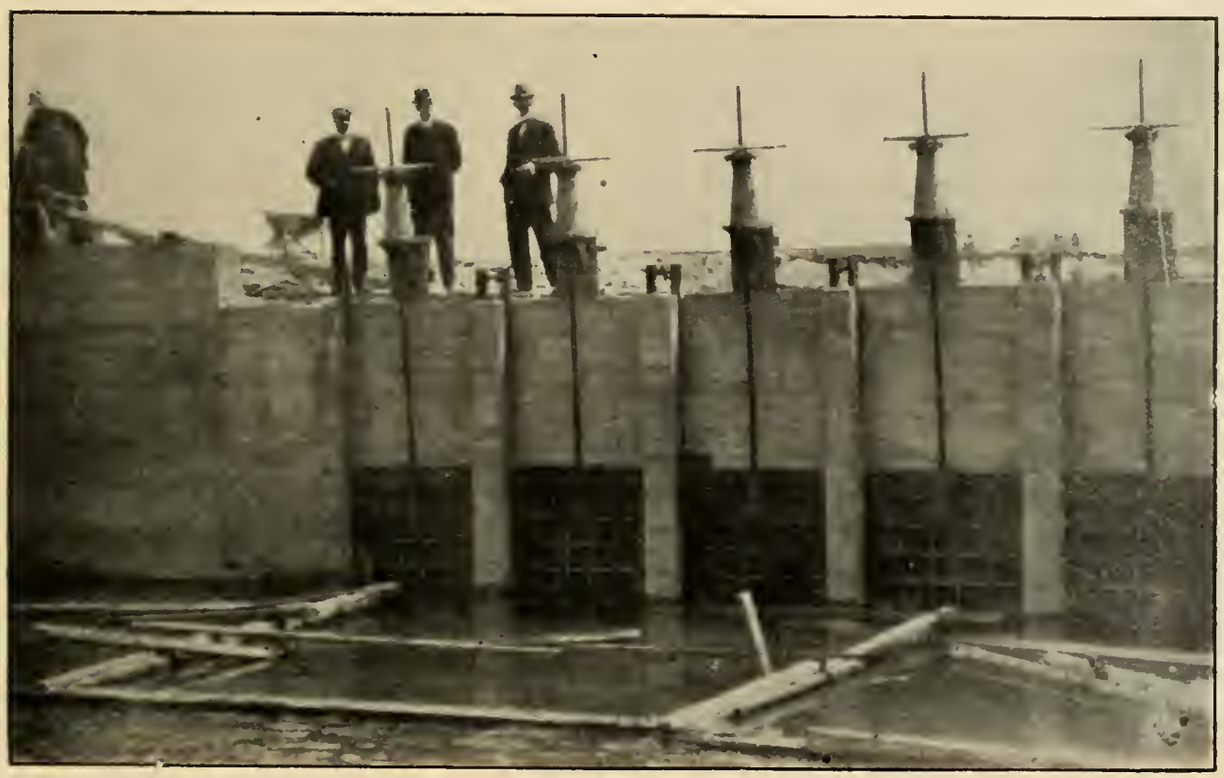
The Billings Bench, a large tract of fine land under the Billings Land and Irrigation Company project is already well provided with water and a highly prosperous and happy farming community occupies it. Where six years ago not a single home existed now are scores of farms in a high state of cultivation. There are ten school houses for as many school districts in this new settlement which is being extended wider and longer every month in the year by new settlers under the project. This project will hold more than twice the people now settled upon it with the average farm unit of 70 acres.

This settlement paid in taxes for 1910 over twenty-five thousand dollars.

It is estimated that irrigation enterprises in the neighborhood of Billings has more than doubled the population of that thriving city during the past six years and added to its taxable wealth two and one-half million dollars.

The Big Timber project comprises very fine lands on both sides of the Yellowstone River near the town of Big Timber, the County Seat of Sweet Grass County. The northern tract occupies the sunny slopes just north of the Big Timber Creek. The whole of this tract is now ready for patent and the State has made application for the same.

The entire system of reservoirs and canals is complete, wanting only the small laterals which will be added as the settlement is extended. There has been expended thus far on this north side system and upon effort to settle same the sum of $350,000.00 or more. About 2,300 acres are settled and beautiful homes are appearing as if by magic and culti-



Headgate on Project of Conrad Land & Water Company.

vation is being rapidly pushed, splendid crops having already repaid effort by the industrious settlers.

Work on the south side tract has also been begun. A small ditch covering a section inaccessible from the main system has been completed.

The two mile tunnel upon both ends of which was being pushed had to be abandoned on account of the character of the material encountered. The soft shaly rock mixed with disintegrating slate from "rotten granite" put the expense of its support at a prohibitive figure and in consequence the whole plan of irrigation here must be modified. This will result in the relinquishment of a large part of the original segrega-

tion but what remains still makes a most desirable project which will take the cream of the tract originally applied for. The best lands will be selected out of this large area and irrigated and reclaimed from a lower line of canal. The newly planned system will probably be in operation in the early spring of 1912.

The Valier Project has shown remarkable vigor and brought about results that are marvelous, in spite of the fact that because of the death of the financier who backed the proposition, active operations have been for some months suspended.

The embarrassment is soon to give way through reorganization of the promoters and there seems to be every reason to hope that no serious results will accrue.

The project is located in Northern Montana, about the center of Teton County.

It is about seventy (70) miles northwest of Great Falls and about one hundred and twenty (120) miles north of Helena.

The project is touched by the Great Northern Railway and is traversed from end to end by the Montana Western Railway.

There are several reservoirs covering this project, the largest, Lake Frances, nearly completed. This reservoir will have a capacity of about 170,000 acre feet. About 200 miles of mains and laterals have been built in the canal system and preparations are being made to add many more miles to the same during the coming season.

Already, two hundred and sixty settlers have purchased homes under the project and it is confidently predicted that this settlement and adjoining ones of Conrad and Bynum will soon make a community of the proportions of a county, in fact this neighborhood will become the largest unbroken farming community in the State, covering as it will over a half million acres of land practically in one solid body.

The Teton project, under contract of Teton Co-operative Reservoir Company is made practically contiguous to the foregoing through intervening "deeded lands" to be irrigated by the two systems. This project is to be covered by a system of reservoirs only one of which may ever be needed. This reservoir will cover 8 or 9 sections of land in Townships 25 and 26, Ranges 6 and 7 West.

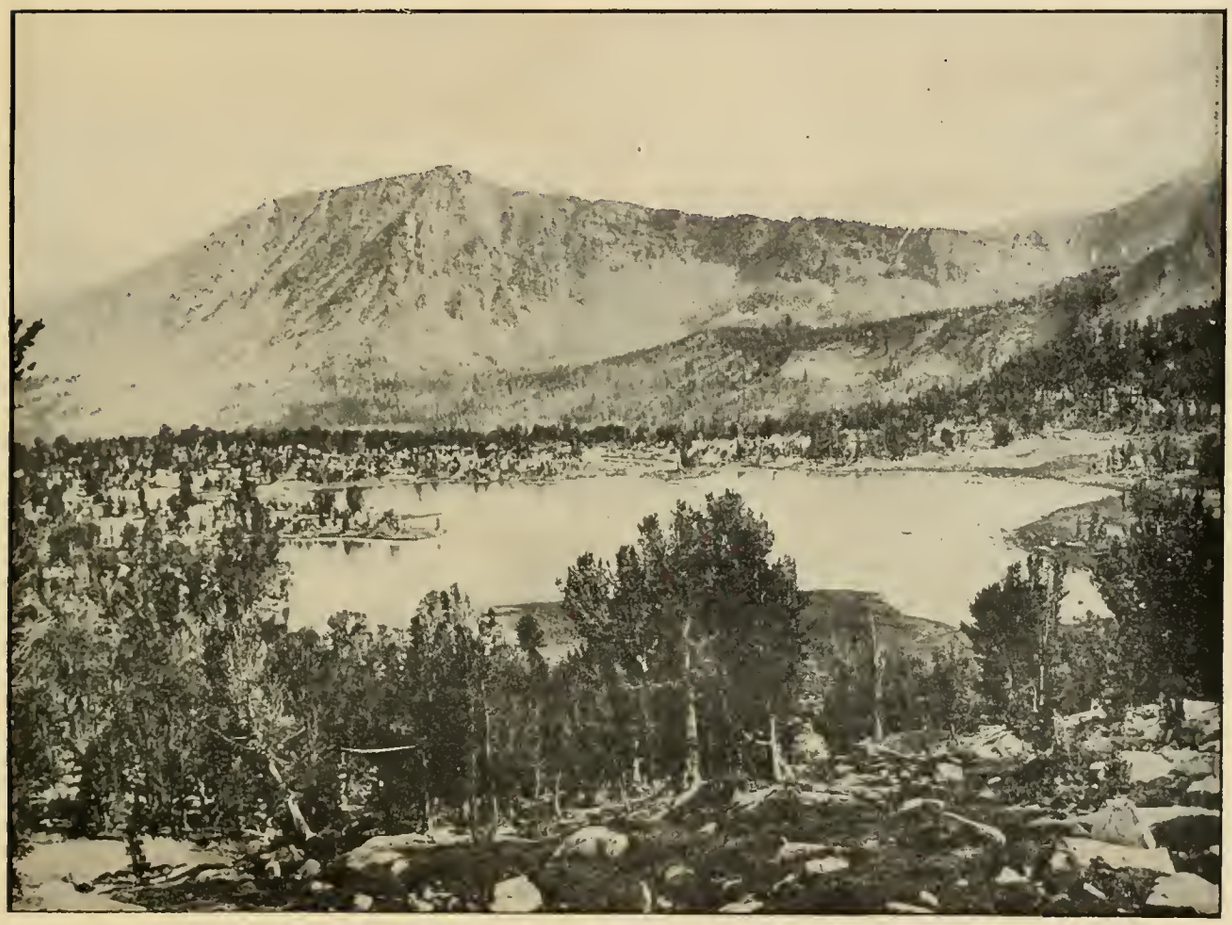
The dam is now far on the way of completion. It is over one-half mile in length and is pronounced by experts to be built of the best materials. It is expected that some modification will be called for by the State and the Federal Government respecting the seepage now observable under this dam, but this can be accomplished, and when it is done this structure will reflect credit upon the State and upon the contractors and will be a great satisfaction to the farmers who will in future years, depend upon it.

Lists No. 5 and 6 are comprised in the Dearborn project which the Ames Realty Company of Saint Louis and later the Great Falls Land and Irrigation Company contracted to reclaim.

These contracts have lapsed by limitation of time, but it is hoped

that other contractors may be induced to take up this project and even yet make it a success, as all who have ever seen these lands agree that here is one of the best Carey propositions in the State.

Lists Nos. 13 and 15 comprise separate projects on the Musselshell River. The former comprises about 20,000 acres of the most fertile lands of the Musselshell bottom. This project was thoroughly examined as to topography, soil, climate and water resources by Prof. Samuel Fortier, formerly of the Agricultural College at Bozeman (now Chief of the Bureau of Irrigation Investigation at Washington, D. C.) and pronounced by him to be a splendid irrigation proposition. Helena and Missoula parties have this interprise in hands and will "dodge" no pains or cost in forcing here a complete success.



An Irrigation Storage Reservoir.

List No. 16 is of lands lying in the Ruby Valley between Sheridan and Dillon. It will be largely a reservoir proposition but the site is of the very best and the soil is good.

It seems strange that this late day finds such a tract yet unsettled for looked at from most any viewpoint, this is a most desirable project.

List Nos. 17, 19 and 21 comprise lands near and in part upon the Flatwillow Creek. The first two lists may be abandoned because of the great cost of reclamation revealed by the preliminary surveys. The last named (List No. 21) will probably be pushed to completion. Men of good business standing in Butte and Lewistown have these segrega-

tions in hand and promise soon to make definite the matters of contract upon them.

One of the best reservoir sites in Montana is to be utilized to provide water for the lands in List No. 18. The Red Rock Reservoir and Irrigation Company the promoter and proposing contractor in this proposition has already put up a very costly dam confining the water of Red Rock River for this system. This dam will be improved and raised much higher and the reservoir will then be capable of delivering water to thousands of acres which without it must lie for decades a useless desert.

List No. 22 has in it about 20,000 acres of fine land which will be reclaimed by waters from the Little Missouri. This is a recent application, and yet, one which gives promise of a splendid irrigation proposition which will add much to the taxable property of Custer County.

Digging an Irrigating Ditch.

These Carey projects will be of incalculable value to Montana in the matter of early settlement of our desert lands.

The Carey Land Act Board has worked indefatigably to put this form of State Reclamation on its feet. It is now an assured success and will always reflect credit upon this Board and other State officers who have contributed to the end.

The Board will recommend to the incoming Legislature that the law creating it be changed and that its membership be composed of elected State officers. The State Examiner finds the duties devolved upon him to interfere to some extent with the proper discharge of the pressing and constantly increasing duties of his own office; and the State Engineer desires to be relieved from membership, continuing to assist in a clerical

capacity, so that he may devote more time to work in the field which the increasing number of projects demands.

Postoffice addresses of Applicants and Companies interested in Carey Act Projects and Counties in which said projects are located:

Billings Land and Irrigation Company, Billings, Montana. (Yellowstone County.)

Dearborn Project, Great Falls Land and Irrigation Co., Suite 826, First National Bank Bldg., Chicago, Ill. (Lewis and Clark County.)

Glass-Lindsay Land Company, Big Timber Montana. (Sweet Grass County.)

Conrad Land and Water Company, Valier Montana. (Teton County.)

Teton Co-operative Reservoir Company, Choteau, Montana, or T. A. Marlow, Helena, Montana. (Teton and Chouteau Counties.)

Musselshell Project, T. T. Black, Missoula, Montana. (Meagher County.)

Franklin Project, Franklin Irrigation Co., care of John Edgerton, Helena, Montana. (Fergus County.)

Ruby River Project, R. A. Carnochan, Butte, Montana. (Madison and Beaverhead Counties.)

Red Rock Reservoir & Irrigation Company, Dillon, Montana, or Newell C. Knight, 400 Royal Insurance Bldg., Chicago, Ill. (Beaverhead County.)

Flatwillow Project. Walter J. Winnett, Lewistown, Montana. (Fergus County.)

Little Missouri Project, Henry R. Albion, Helena, Montana. (Custer County.)

Counties and Towns.

Population, Wealth, Schools and Industries.

In this chapter the Bureau has compiled information with reference to the industries and resources of Montana by counties, cities and towns. Many towns of importance do not appear because the Bureau could not secure the necessary data.

Under the present system the counties are required to pay a certain rate of taxation to the State and the assessors try to protect their several counties against unequal burdens with the result that the assessed valuation represents probably 30 per cent of the cash value of the property.

The amounts expended for school purposes, and the value of school properties, including buildings, sites and libraries, appear as reported by the county superintendents to the State Superintendent of Public Instruction.

It is fair to say that many objections have been made to the United States census returns but the Bureau does not have any other means of ascertaining the population on a common basis. To increase the census of one town would be an injustice to other towns. The population given according to the United States census report is marked with a star, but for many towns the figures appear as reported to the Bureau.

BEAVERHEAD COUNTY.

Beaverhead County is a prominent southwestern county of Montana, it borders on the Rocky Mountains and its area is 4,597 square miles. Its assessed valuation amounts to $7,595,324.00. The State Normal College is located at Dillon, the County seat. The county has a high school and also 31 public schools. The valuation of public school property amounts to $60,338.00, and last year $31,603.71 was spent for school purposes.

The county embraces a picturesque district which is overflowing with natural resources: mining of gold, silver, lead, copper, gold, placer and dredging, agriculture and stock raising produce abundant wealth and insure the future prosperity of the county.

Last year 70 miles of railroad were constructed in the county and about 50 miles surveyed upon which the construction will soon be finished. The population of the county is 6.446.*

Dillon.

Dillon is the county seat located on the Oregon Short Line which connects the city with all points north and south and it is expected that in a few months the Gilmore and Pittsburg will be running trains through

Threshing 4 Miles from Dillon, Oats 70 Bu. Per Acre.

Dillon making connections with points east and west.

Dillon has a population of 1,835.*

The city is the commercial center of the southwestern part of the state, a vast agricultural and mining and stock raising district, and has a history of a steady, healthful growth. The city and the county have the smallest delinquent tax lists in the northwest, there being at the present time on the tax list less than $25.00 against Dillon and less than $200.00 against the taxpayers of the entire county. Dillon has one hotel, two banks and the following denominations have handsome church buildings and residences for their ministers: Baptist, Catholic, Episcopalian, Methodist and Presbyterian; and several denominations meet in one or the other of the above buildings.

$75,000.00 has been secured for a new hospital.

The Hearst public library has one of the finest buildings of its kind in the state, well furnished throughout and supplied with many hundred volumes from the best authors.

The school facilities are excellent. The public schools employ ten teachers, are graded up the standard of the state and each year send a number of their graduates to the county high school where all courses provided for high schools are successfully taught.

The State Normal College sends out many trained teachers to all parts of Montana and some into other states.

The city has two weekly newspapers, The Examiner and Tribune, two wholesale houses, twelve retail stores, water works, electric lights and a sewer system.

The water is conveyed to the city from a mountain stream by gravity

and is adequate for a much larger population maintaining at all times a pressure of more than 100 pounds to the square inch.

The electric plant is not owned by the city. Last year the city expended $25,000.00 on its sewer system and cement walks. Two business blocks and a number of dwellings were erected at a total cost of $140,000.00. Only a small amount of water power has been developed but there is about 300 H. P. available near the city.

The tax levy is very reasonable never exceeding 23 mills on an assessed valuation of about 35 per cent of the market value of all property.

Dillon has openings for profitable investments in a wool scouring plant, a rolled oat factory and smelters.

Nearly everything that can be raised in any part of the state is

Harvesting Oats Eight Miles North of Dillon.

successfully grown in and around Dillon, including grain, forage, vegetables, apples, plums, cherries and berries.

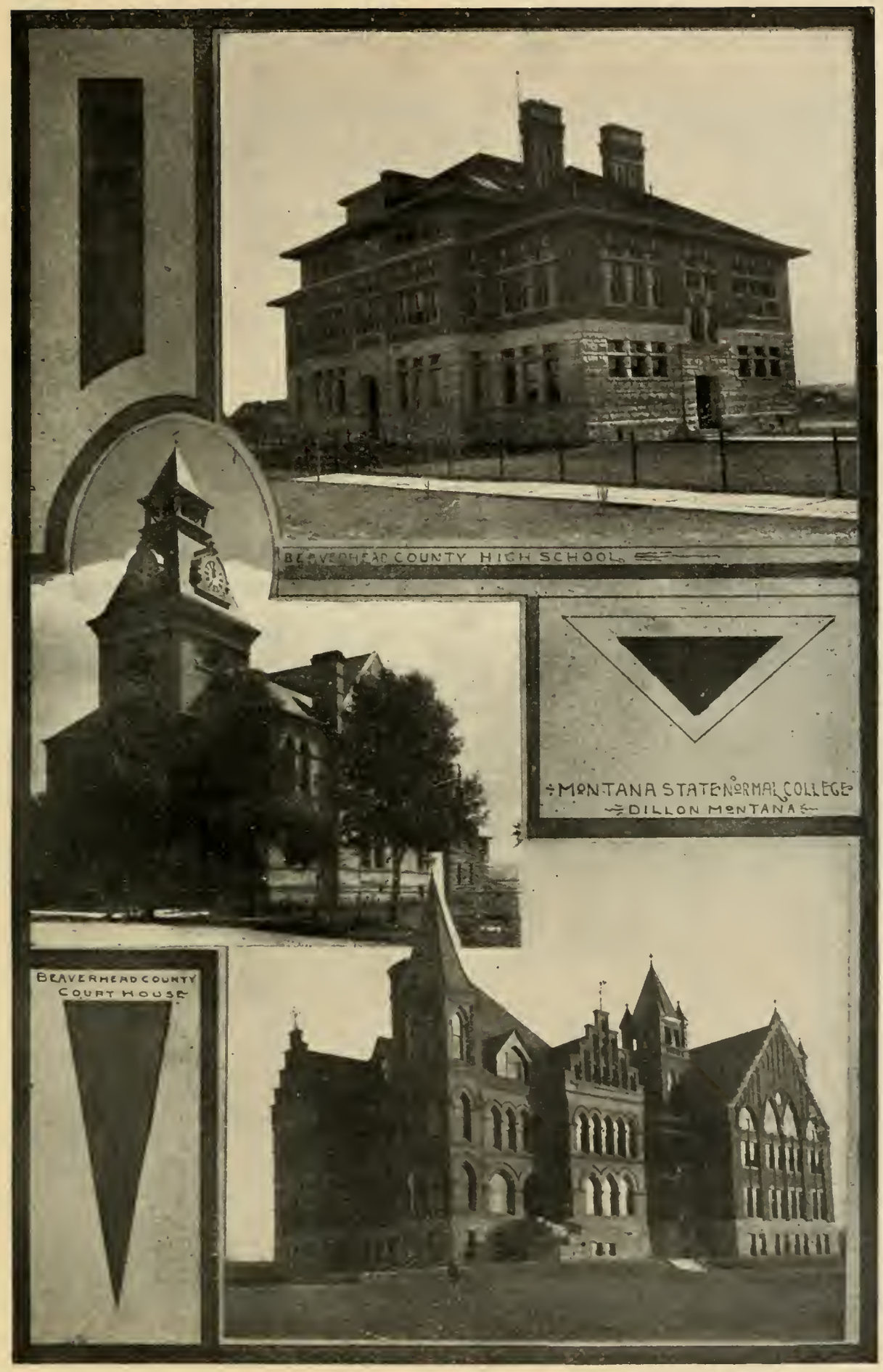
Property in and around Dillon is very reasonable in price considering the fertility of the soil and the convenience of the market.

Fire insurance rates are low on account of the water supply available under high pressure at any time.

The citizens take special pride in their buildings, lawns and shade trees; and in every improvement which tends to the beauty of the town and they have made it one of the cleanest and most beautiful towns in the northwest.

Lima.

Lima is on the Oregon Short Line, has a population of 600, three



Public Buildings in Dillon.

churches, one school, two hotels, one opera house, two general stores, and railroad shops. Fuel is cheap.

Lima has water works and electric lights. The principal improvements last year were made by the Oregon Short Line Railway Co., costing $20,000.00. The Lima dam has a capacity of 72,000 acre feet with 4,000 acres now under irrigation and in addition another dam is now being constructed to cover 500 acres of prairie land.

The school is held nine months each year and the district is in good financial condition with a surplus of $2,000.00 in the treasury. The farmers in the vicinity are prosperous and have built many new residences during the last year.

Raised on Dry Farm 2 Miles South of Dillon.

Wisdom.

Wisdom is the principal town in the Big Hole Basin and has a population of about 350. A church, a splendid school house, three large mercantile houses, a newspaper plant, a hotel and other establishments comprise the business section of the town.

Among other towns of importance may be mentioned the town of Jackson located at the Hot Springs in the Big Hole Basin and Red Rock and Dell on the Oregon Short Line south of Dillon.

Sheep 8 Miles South of Dillon.

BROADWATER COUNTY.

Broadwater County has an area of 1,182 square miles, its assessed valuation for 1910 was $3,205,616.00. The population of the county is 3,491.* The county has three principal sources of revenue, consisting of agriculture, stock raising and mining. It has a county high school also 21 public schools with a property valued at $21.293.71 and last year the county spent $13,915.00 for school purposes.

Townsend.

Townsend is the county seat of Broadwater County and has a population of 900. It is situated on the main line of the Northern Pacific Ry. which runs directly through the center of the county and follows the Missouri river for nearly half the way in the county. Townsend is in the center of the best agricultural land.

With the rest of Montana it is advancing rapidly, and the foot-hills surrounding the town are being fast taken up by progressive farmers. The town has increased one-third in population since 1904 and the improvements now being made are permanent and artistic in character. The town owns and operates an up-to-date electric plant and has a good water system under construction at an approximate cost of $60,000.00. Its business men and citizens are progessive and prosperous and strangers coming within its gates declare it an ideal place to live.

The Townsend Chamber of Commerce has assured the residents that in a year or so an electric line will be built connecting Townsend with the famous Radersburg mines.

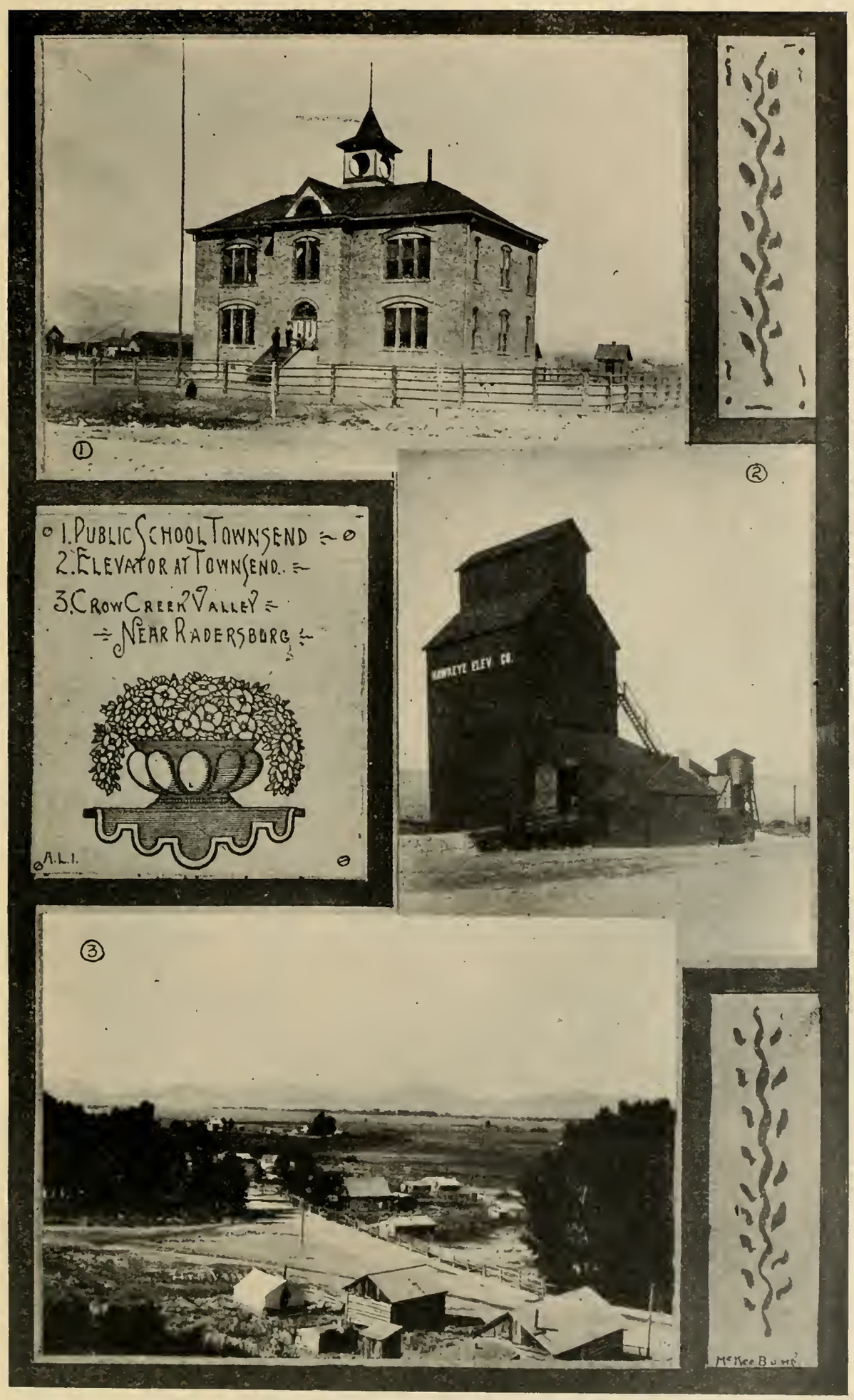
The Northern Pacific acting with the Great Northern is now surveying a line from White Sulphur Springs through Townsend to Helena, the object being to avoid heavy grades, and to tap a part of the fertile land of Broadwater County heretofore untouched by the influence of a railroad. This line when completed will be an extension of the cut-off now being constructed by the Northern Pacific from Glendive, Montana, to White Sulphur Springs, Montana.

Townsend supports one newspaper, two banks, four churches and one public school. It has the county high school, one flour mill, one elevator, one hospital, fifteen retail stores, a cigar factory and a creamery with an output in 1909 of 400,000 pounds.

Last year Townsend spent $1,000.00 on permanent improvements and ten new buildings were erected in the city at an estimated cost of $20,000.00.

Winston.

Winston is on the Northern Pacific Ry., has a population of 150, one church, one public school, and one general store, has water power with 50 H. P. developed for a stamp mill. There are agricultural lands in the vicinity still open for location. The principal industry is mining



Public School and Elevator at Townsend: Scene in Crow Creek Valley.

CARBON COUNTY.

Carbon County is queen of Eastern Montana, her citizens are princes and her subjects are loyal and her domain is rich and prosperous.

Carbon County has an area of 2,411 square miles and is assessed for $7,191,148. The population is 13,962* of which a large number are engaged in mining. Carbon County has a free high school also 53 public schools with property valued at $170,178.00 and last year the county spent $52,218.42 for school purposes.

The industrial resources of the county are mining, farming and stock raising. The numerous small streams flowing down its fertile valleys furnish an abundant supply of water for irrigation. Coal and mineral are added to the agricultural resources and their inexhaustible deposits will contribute toward making Carbon one of the most prosperous counties in the State. Since Jan. 1, 1910, 200 miles of railroad have been constructed and 75 miles are now under construction.

Red Lodge.

Red Lodge, the county seat, is located on the Rock Creek at the base of the mountains and is the terminal of the railroad (N. P.), with passenger service every day and has a population of 4,860*.

The city has six grade schools, one high school, two hospitals, four church buildings, one newspaper, three banks, three hotels, two wholesale houses and thirty-five retail stores.

Last year the city expended $30,000.00 on permanent improvements and three new business blocks were constructed at a cost of $65,000.00.

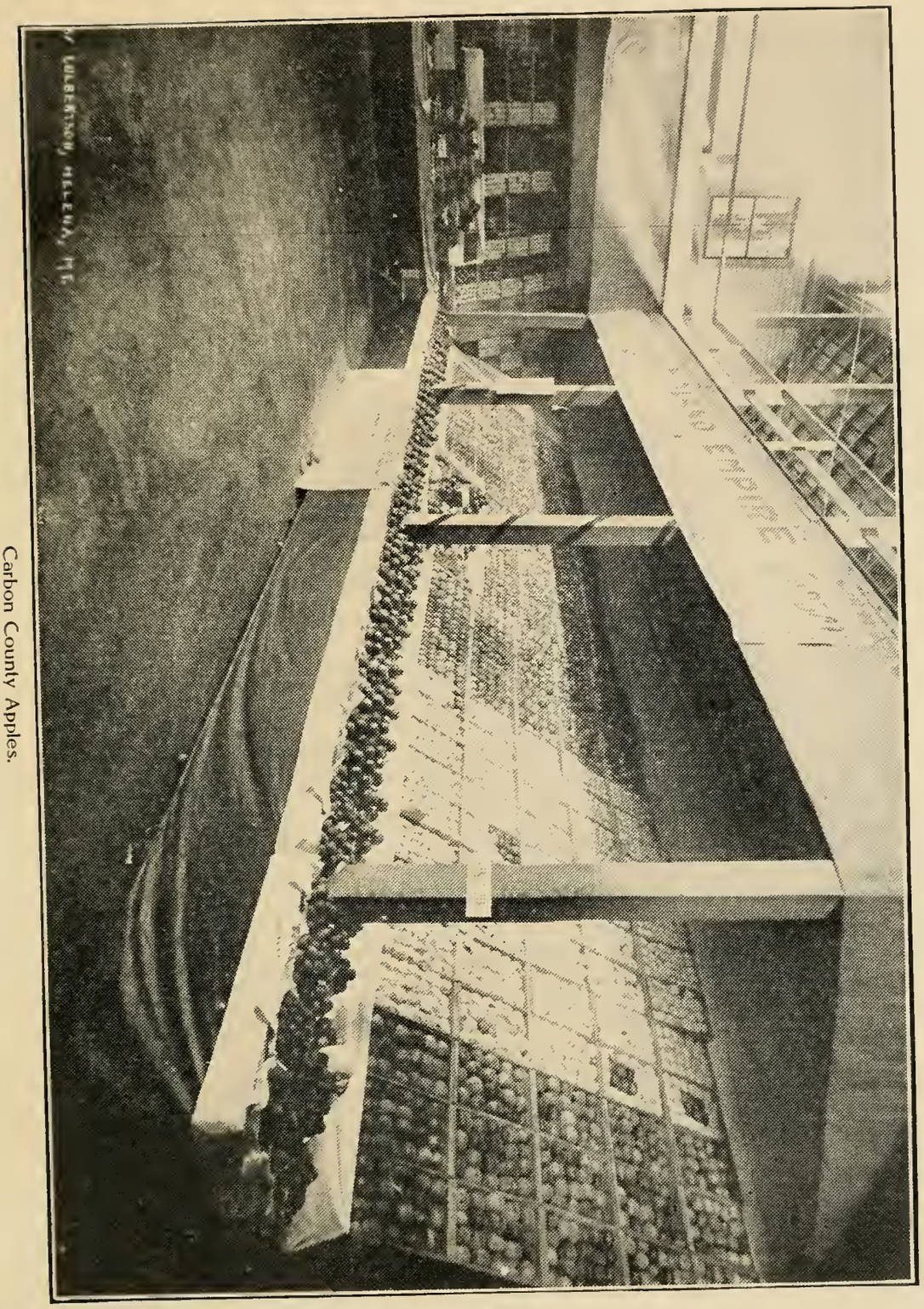
There is no city more thoroughly lighted, the eelctricity being generated at the coal mine plant and sold to the city and its residents at a figure almost nominal. A sewer system has recently been installed at a cost of nearly $50,000.00. The water system is unexcelled, the government analysis of the water supply proving it to be the very best in quality. Beautiful cement sidewalks extend throughout the entire city. Fuel can be secured at prices that are very low. The city has one elevator and also a creamery.

Red Lodge presents an attractive appearance during the shipping season, when hundreds of wagons are lined up at the freight depots and at the elevators.

There are times when it is with difficulty that a person can walk upon a side street, owing to the congested condition, caused by the jam of freight wagons.

The principal industry is coal mining and the demand for Red Lodge coal is growing at a phenomental rate in the leading cities of the State, so that during the last year many spurs had to be built from the railroad to handle the output of the mines.

Red Lodge is the central point from which radiate magnificent stretches of agricultural, horticultural and hay lands and stock-feeding ranges. It is the center of a large community of diversified interests, the headquarters where the farmer, the ranch-man, the orchardist, the stockman, the miner and timberman all transact their business.



Carbon County Apples.

Absarokee.

Absarokee is the largest shipping point in the western section of the county. It is situated near the point where all the streams of the west side empty into the Stillwater River. Its population is 150.

Last year eight new buildings were erected at a cost of $10,000.00. The town has two general stores, one bank, one hotel, one church, one public building and many prosperous homes. No water power has been developed, but it is estimated that 1000 H. P. is available.

Joliet.

Joliet is the principal town below Red Lodge on Rock Creek. The population is about 500. The town spent $1,000.00 last year on permanent improvements and ten new buildings were erected at a total cost of $35,000.00. It has one elevator with a capacity of 32,000 bushels, one flour mill which cost $50,000.00 and has a 200 barrel capacity. The fire hall cost $1,000. It has one school building, one newspaper, four churches, two banks, one hotel and three general stores.

The adjoining country is a good grain and fruit section and there are good coal deposits near. It is the principal shipping point of the branch line of the Northern Pacific for the central part of Carbon County.

Belfry.

Belfry is an important town in the upper Clarks Fork Valley. It has water power available but none developed. One hundred new buildings were erected last year at an estimated cost of $120,000.00. It has a public school, one church, one bank, one newspaper, two hotels and seven business houses. It is an important shipping point on a line connecting with the Northern Pacific. Up the valley and down for miles are productive farms of hay, grain, sugar beets and fruit.

Bridger.

Bridger is the second town in the county in population, having 700 inhabitants. It is located on the Northern Pacific.

There is water power available but not any developed. In common with other towns of Carbon County, fuel is cheap. Last year the town spent $2,000.00 on improvements and 15 new houses were built at a total cost of $50,000.00. It has water works and electric lights, one creamery with an output last year of $2,500.00. One hospital, one school building with the public school and high school combined, two church buildings, two banks, one newspaper, four hotels and seven retail stores.

The resources are farming and mining, a splendid combination for a prosperous town. The coal output is about 100,000 tons annually.

Fromberg.

Fromberg is on the Northern Pacific, has a population of 600, one public school, one high school, three churches, one newspaper, one bank, two hotels, eleven business houses, one elevator, two coal mines, one brick and tile plant, one cement plant and a canning factory.

Last year $45,000.00 was expended by individuals on new buildings. Coal can be secured the year around for about $2.00 per ton. It has electric lights from a mining plant near by. Water power can be developed on a large scale. Sufficient quantities of fruit, eggs, butter and meats are produced to make a cold storage plant a paying proposition.

Bear Creek.

Bear Creek is located on the Montana, Wyoming and Southern Ry., and has a population of 400. Sufficient water power has been developed to run a 50 K. W. generator. Last year $10,000.00 was spent by the town on improvements and ten new houses were built at a total cost of $25,000.00. The town has water works and electric lights. It has one hospital, one bank, two hotels and three general stores. Fuel is cheap. Bear Creek is the center for a number of operating coal mines. One mine has a capacity of 11,000 tons per month and a monthly pay-roll of $12,000.00. Other properties are operated on a large scale.

CASCADE COUNTY.

The area of Cascade County is 2,764 square miles and the population is 28,833* with an assessed valuation of $21,246,820.00. There is only one county in Montana that exceeds Cascade in wealth.

It has 83 schools with property worth $446,917.00 and last year $193,555.56 were paid out for school purposes.

The county consists of diversified valley, bench, foothill and mountain lands. The Missouri River is the principal stream but a number of its tributaries discharge their volumes of water into it within the boundaries of Cascade County. The water in all its rivers is pure and healthful. Near the city of Great Falls, the river affords water power sufficient for manufacturing and lighting purposes unsurpassed, if equaled, on the continent.

Wheat, oats, barley, rye, alfalfa, timothy, root crops and vegetables are successfully grown. Small fruits are grown extensively and apples in certain localities. A large portion of the county is underlaid with bituminous coal and Cascade is one of the banner counties in the production of coal. Other resources consist of iron, gold, silver, lead, fire clay, cement rock, gypsum and an inexhaustible supply of lime of great purity.

The farmers are prosperous with good bank accounts, the manufacturers are doing business on an extensive scale, and the success of the business houses is commensurate with the great resources of the county and still Cascade holds a multitude of opportunities for new enterprises.

The City of Great Falls.

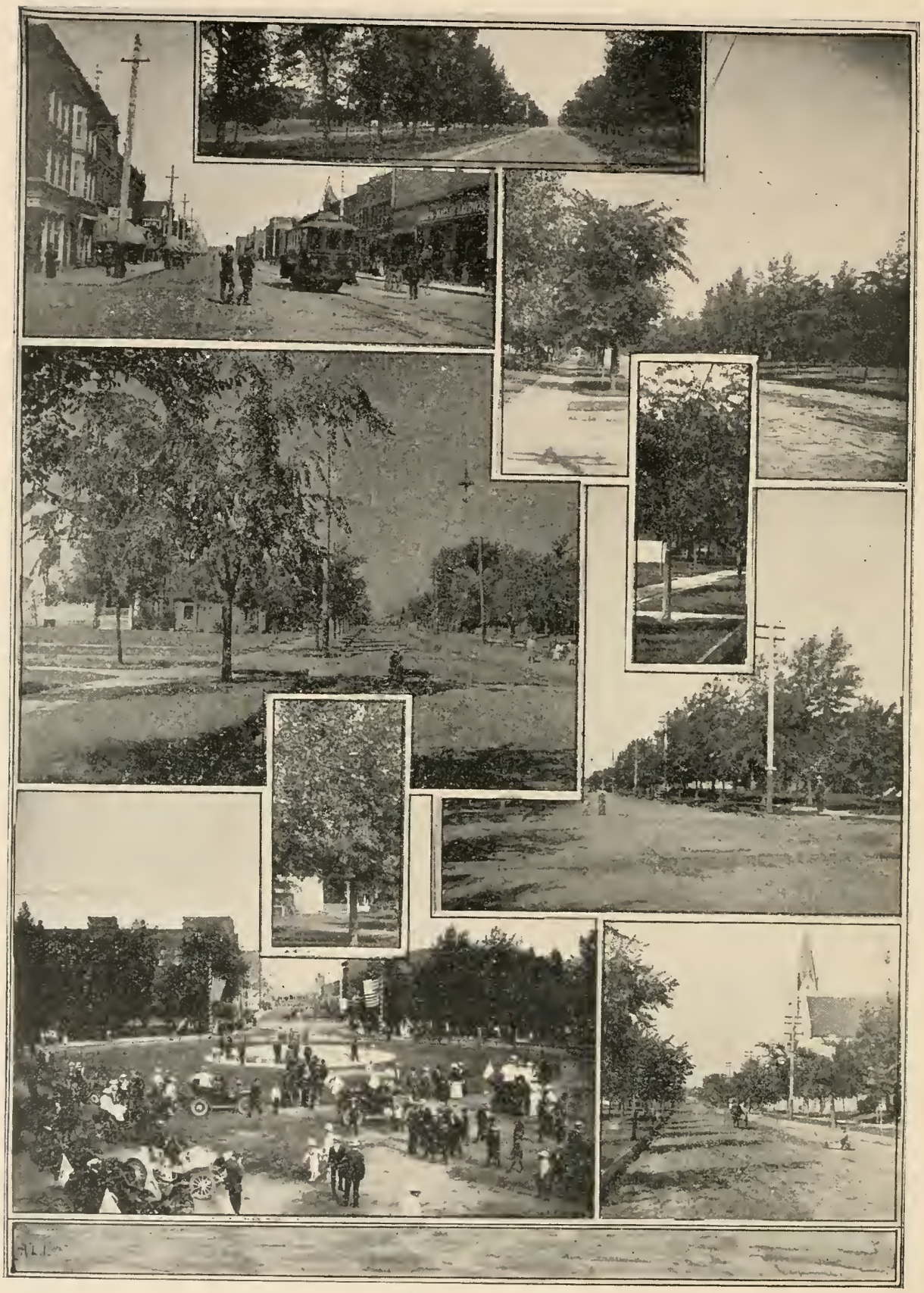
Great Falls is the county seat of Cascade County, and has a population of 13,948*, a school census of 6,431 and an actual school enrollment and attendance of 3,108.

Great Falls is built on a slightly rolling plateau that lies in a circular sweep of the Missouri River, and has grown to be a beautiful city of handsome and comfortable homes, made so by the civic pride that is born of the prosperous and contented home owners. There are now more than 20 miles of boulevarded residential avenues and these are shaded with more than 12,000 elms and other ornamental shade trees.

Broadwater Bay is one of the many attractions of the city, being one and one-half miles at the widest point. Twenty motor boats and many other kinds of craft of more or less pretentions are used by pleasure seekers on the bay and they often motor up the river 15 miles to Box Elder Park. The city owns more than 600 acres of park, 100 acres of which have been developed in the highest degree of park culture.

Gibson Park has a band stand and many beautiful flower beds and extensive walks and driveways along the river front. Black Eagle Park is a beautiful resort overlooking the falls from which it gets its name. It is equipped with dancing pavilion, skating rink, athletic grounds, ball park, race trace and convenient refreshment stands.

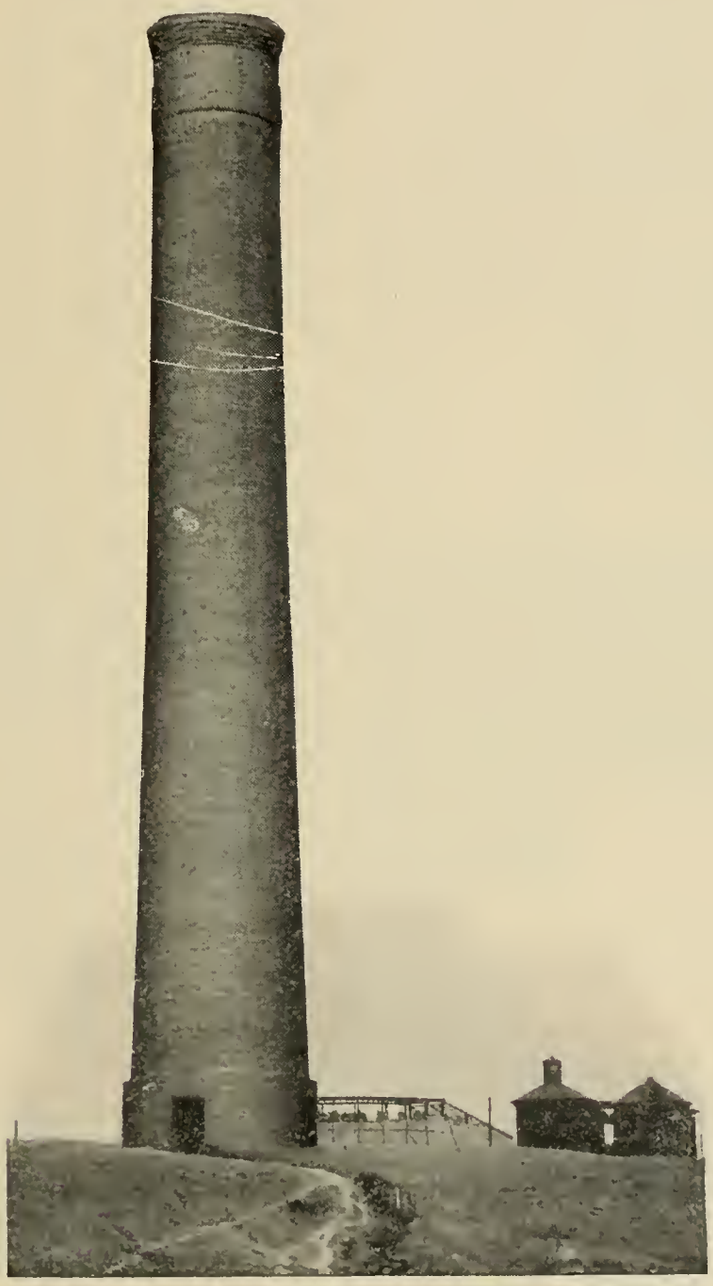
Last year the city spent $142,958.00 on permanent improvements,



Residence Avenues and Business Streets, Great Falls.

204 dwellings and 18 other buildings were erected at a cost of $1,049,000.00 and the number of new buildings this year more than double that of last year.

The city is provided with an excellent water system, owned and operated by the municipality, the supply being conveyed through six miles of mains and thirty-one miles of distributing mains. The sewer system comprises twenty miles of laterals and four miles of mains constructed with brick and cement. The city is lighted with both



Highest Smoke Stack in the World.

electricity and gas, electric cluster posts being used to illuminate the business streets.

There are four banks; nineteen churches, which cost more than $300,000; seven hotels with another to be opened the first of the year which will cost $400,000. The Court House cost $300,000; the public

Park Views.

library $30,000; opera house $55,000; two hospitals $175,000; Orphans' Home $80,000; seven graded schools and a high school $356,021, and a new passenger depot $125,000. The new Federal building now under construction will cost $250,000.

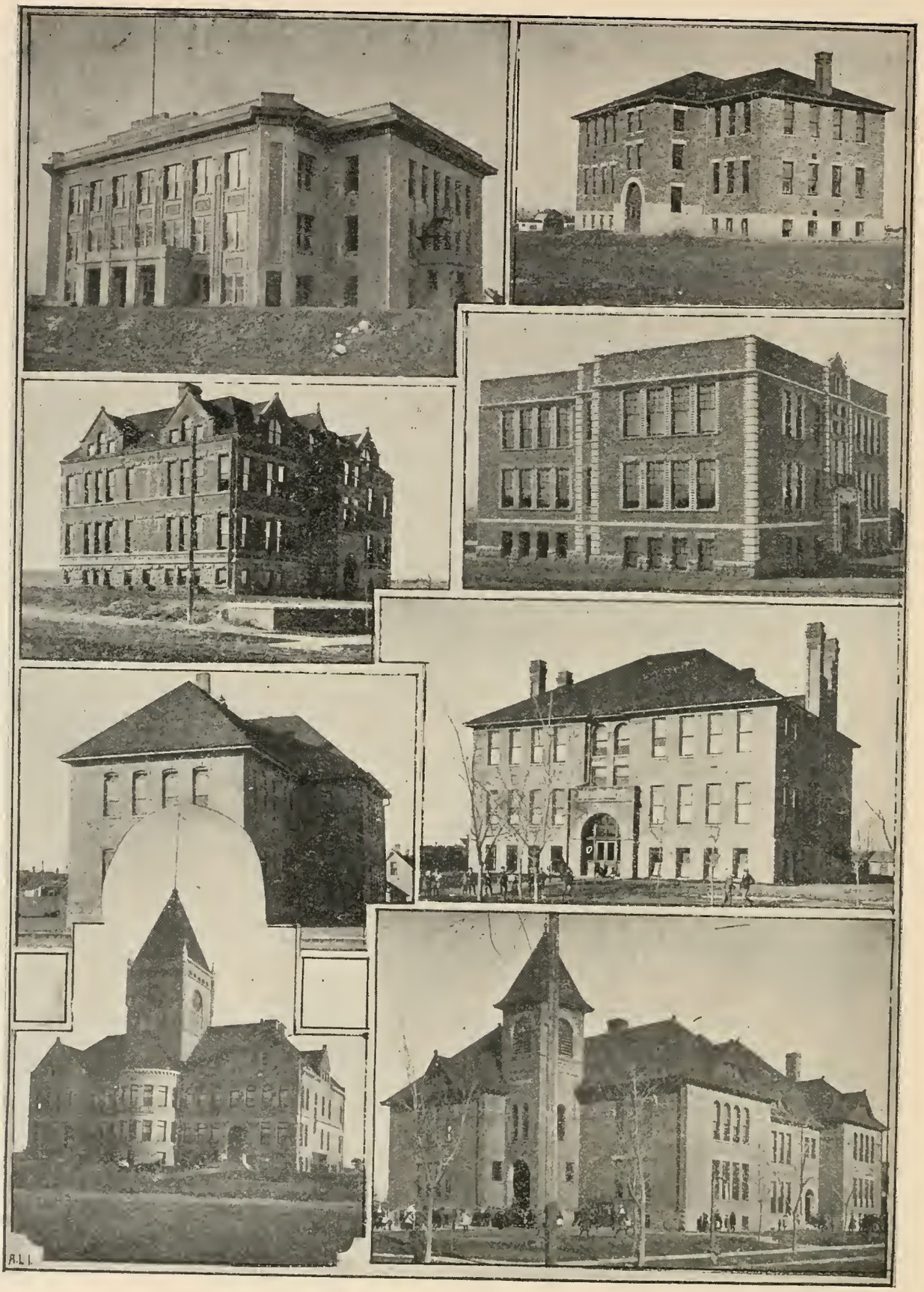
An up-to-date ten-minute electric street car system having over twelve miles of trackage provides convenient transportation to all parts of the city. From Great Falls railway lines diverge to every point of the compass. Five lines of the Great Northern radiate from the city, and the Great Falls line of the C. M. & P. S. is now under construction.

Great Falls Smelter.

Within a few months the connecting links of the Colorado and Southern will be completed and Great Falls will be on the Gulf-to-Sound transcontinental line. The railroads furnish excellent facilities for the distribution of merchandise from Great Falls. There are 16 wholesale and jobbing houses as follows: Wholesale groceries, two; packing house products, three; drugs, four; fruit and produce, three; oils, three; liquors, four; and practically all lines of trade are represented.

There are four creameries, having an annual output of 300,000 pounds of butter yielding a revenue of $90,000.00, a flour mill of 1,000 barrels capacity. Two of the largest brewing and malting plants in the west, iron works and machine shops, tubular works, sash and door factory, babbit metal foundry, copper and sheet metal cornice works, brick and tile factory, cement block and tile factory, decorative stone works, stucco and plaster mills and the second largest copper reduction, smelting and refining plant in the world with an annual output of 100,000,000 pounds of copper. The largest smoke-stack in the world has just been completed at the smelter; it is 506 feet in height and 50 feet in diameter on the inside at the top.

Black Eagle Dam.



Public School Buildings, Great Falls.

Great Falls is called the "Electric City," because the available water power is the greatest in America, there being 75,000 H. P. developed at the minimum flow. The completion of the Big Falls dam will add 100,000 H. P. to this immense motive force. The largest individual user of this power is the Boston & Montana smelter whose annual report shows that it holds the record among the smelters of the state for cheapness of production.

Nearly 1,000 H. P. is used at the Royal Flour Mills which have an annual output of 218,000 barrels. In addition to the above two industries there are twenty manufacturing plants in the city and openings for more smelters, more flour mills, blast furnaces to use the iron ore in the vicinity, wire rolling mills to use the copper output, Portland cement works to use the deposit of hydraulic limestone, and knitting mills to manufacture the fleeces of the countless flocks which are being shipped to eastern points.

Cheap power and cheap sites can be obtained for any of the above industries. There is a great territory surrounding the city for the distribution of manufactured products.

Cascade County produces 1,500,000 tons of coal every year making Great Falls the largest coal mining center of the northwest.

The building of new lines of railroad and the settlement of many millions of acres of rich agricultural areas tributary to this city which is going on rapidly will scatter towns thickly over the rolling prairies of Northern Montana.

Great Falls is the home of the famous "Cow Bow Artist," Charles M. Russell, and has a live commercial club and one weekly and two daily newspapers.

Great Falls is known as the city with the biggest chimney in the country, a city of vast water power, of great agricultural and mineral resources and will become known as the greatest industrial center of the "New West."

Belt.

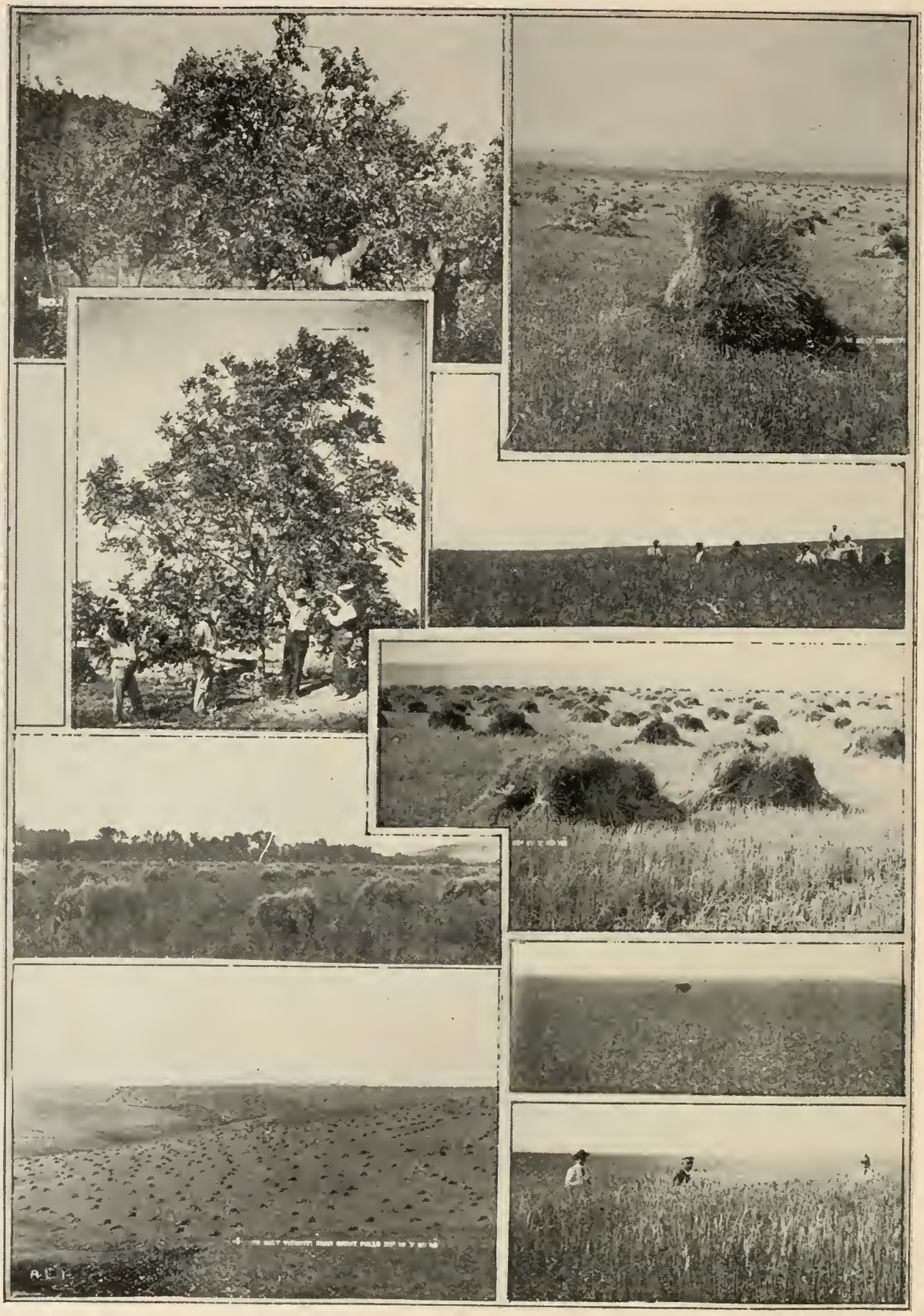
An important city situated on Belt River on the Billings and Northern Railway, has a population of 2,500, electric light and water works system and has expended $8,000.00 in the past year in permanent public improvements. It has two public schools, city hall, creamery, elevator, hospital, four churches, one bank, two clubs, five hotels, thirteen retail stores and has erected twenty new buildings during the past year at an estimated cost of $20,000.00.

Belt is the center of rich agricultural and coal mining districts. Four mines now being in operation employ 400 men. The farming land is all settled upon and is being rapidly brought under cultivation.

Wants a flour mill.

Sand Coulee.

A town of about 400, is situated on the Great Northern Railway about 14 miles southeast of Great Falls. It principal industry is the mining of coal, and it is surrounded by a rich agricultural section. It has one school of six roms, three churches, four stores.



Farm Views in Cascade County.

In Belt Vicinity.

Stockett.

A city of about 1200 population, is located on the line of the Great Northern Railway about 18 miles southeast of Great Falls. It has two schools, three churches, one elevator, one bank, one hotel, three stores, also water works for fire protection and is lighted by electricity. Its principal industry is coal mining. There are several mines operated, the largest of which is the Cottonwood Coal Company with a daily average output of 2,000 tons, employing about 500 men. This mine has one of the finest rope haulage systems in America. The adjacent country is well adapted to grain growing and stock raising, the principal cereals of the district being wheat, oats, and barley.

Stockett.

Cascade.

Cascade, a town of 500 population, is located on the Great Northern Railroad about 30 miles south of Great Falls. It has city water, one high school, one graded school, three churches, one flour mill, two elevators, opera house, one hotel, seven stores and one creamery. Cascade is located

in one of the finest agricultural districts of the county and has expended in building in the last year between $50,000.00 and $60,000.00, the number of buildings erected being 25. Coal can be had for manufacturing purposes at about $3.00 per ton. Its creamery turned out 16,000 pounds of butter in 1909.

Neihart.

Neihart is located in one of the best silver mining districts in the State. The demonetization of silver greatly restricted the output of ore in this district for several years past, but owing to greatly improved concentrating methods mining is assuming a new importance. In the district are the Broadwater group, Benton group and other important properties.

The iron and manganese ores invite investment of outside capital. It has one church, one school, one bank, one hotel, three retail stores, city water works, electric lights and a five hundred ton concentrator. Water power can be developed at this point.

CHOUTEAU COUNTY.

Chouteau County is one of the largest counties in the State, having an area of 15,539 square miles, with a total assessed valuation of $15,736,639 in 1910. The population of the county is 17,191.*

The county is composed of valleys and undulating plains with the Bear Paw Mountains near the center and the Sweet Grass hills in the northwest. There are 62 public schools in the county having property valued at $148,826.00 and last year the county spent $88,474.70 for school purposes.

The principal industries are farming and livestock, although gold mining is becoming an important industry in the southern part of the county.

Fort Benton.

Fort Benton is situated on the Great Northern Railway, and is at the head of navigation on the Missouri River. It has been an incorporated city since 1880. Its present population is about 1,300. It has two banks, four hotels, three churches, one daily and two weekly newspapers, two hospitals. The public and city high school buildings cost $40,000.00. The city hall $6,000.00, the Court House $75,000.00. The city has two wholesale houses and ten retail stores.

Last year $8,000.00 was expended by the city on permanent improvements and 30 new buildings were erected at a cost of $60.00.00.

The city has water works and electric lights. The water power availiable is immense but none has been developed.

Fort Benton is beautifully located on the bank of the Missouri River, the numerous lawns and shade trees and beautiful residences along its streets give to the city a very attractive appearance.

Tributary to Fort Benton is a very large area of the public domain which has been developed to sheep and cattle raising on a large scale, but within the past few months all the land within a radius of 20 miles has been appropriated by land seekers, and under the new conditions, the city is

Breaking Benchland Sod, Chouteau County.

promised a rapid growth. A steam laundry is much needed and there is a good opening for capital in the development of water power.

Carter.

Carter is on the Great Northern Railway, and has a population of 100, one hotel, four general stores, a Presbyterian church, an elevator with a capacity of 40,000 bushels, one public school and needs a bank and flour mill and offers an opening for any kind of factory with cheap power as an object.

The new buildings in the town last year cost about $25,000.00.

Chinook.

Chinook is on the Great Northern Railway, and has a population of 780*. It has three hotels, two banks, Catholic, Methodist and Presbyterian churches, twelve business houses, one newspaper, one public school, one elevator, one creamery with an output of 33,500 pounds per annum.

The town has water works and last year about $40,000.00 was spent on the construction of new buildings and $4,000.00 on permanent improvements. There are openings for an electric plant, a flax mill and investments in land.

Box Elder.

Box Elder is situated on the Great Northern Railway, and has a population of 100. It has one school, two banks, two hotels, and two general stores. Last year ten new buildings were erected at a total cost of $20,000.00. It is supplied with an abundance of pure water and is the natural supply depot for a large agricultural territory.

Big Sandy.

Big Sandy is on the Great Northern Railway, and has a population of 250. It has one bank, two schools, one church, three hotels, and three general stores. The principal industries are farming and livestock.

Harlem.

Harlem is on the Great Northern Railway, and has a population of about 500. It has three churches, one bank, one hotel and an opera house, a newspaper, two general stores and a large number of other business houses. The principal industry is farming.

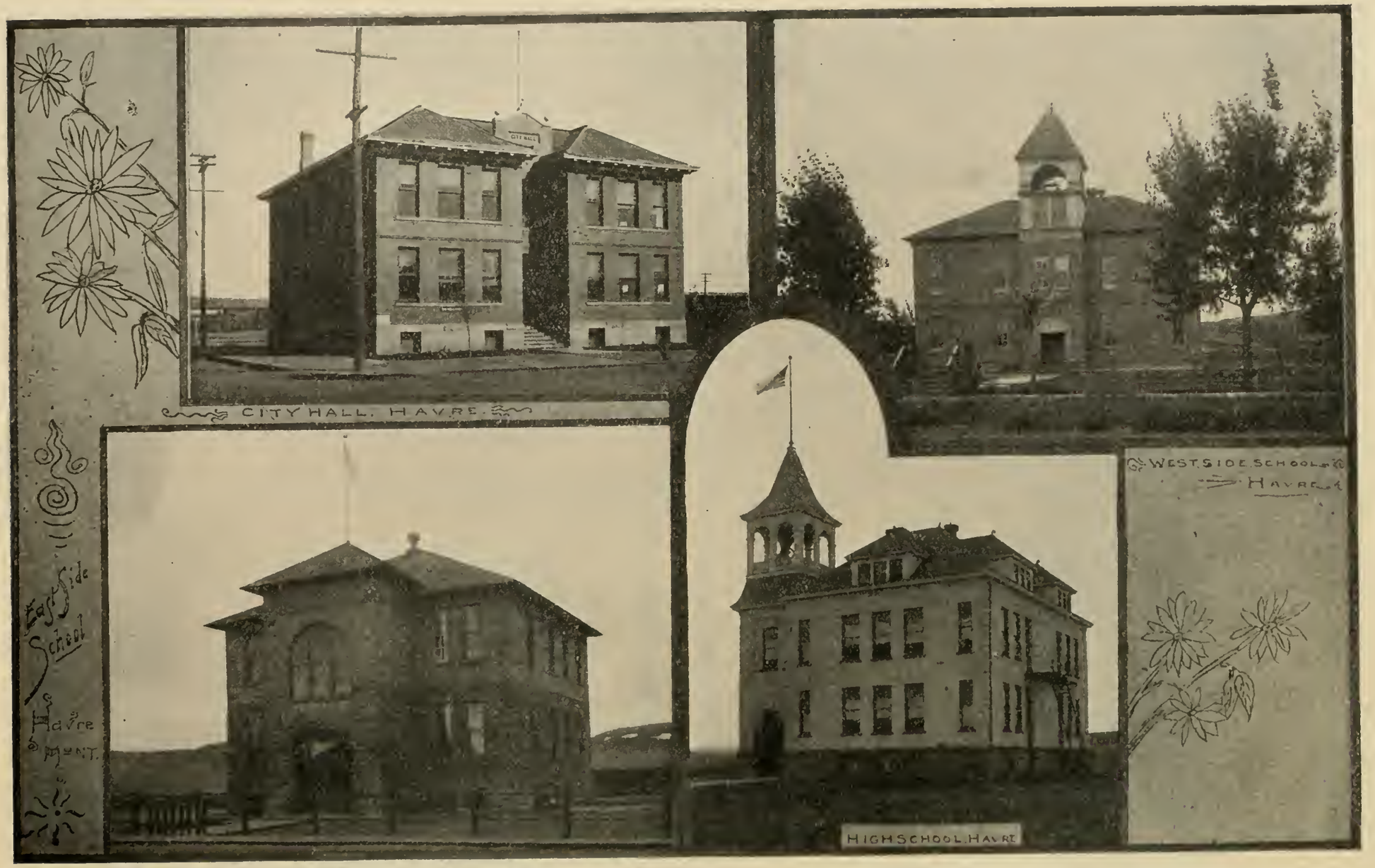
Zortman.

Zortman has a population of about 400 and is connected by stage with Dodson and Malta on the Great Northern. It has one public school, one hospital, four retail stores, and a weekly newspaper. The principal industry is mining and the properties near Zortman are large gold producers and furnish a market for large quantities of food and mining supplies.

Havre.

Havre is located at the junction of the two lines of the Great Northern Railway, and has a population of 3,624*. It has two hotels, three banks, four churches, Catholic, Episcopal, Methodist and Presbyterian, one wholesale house, two newspapers, twenty-five retail stores, two public schools and one high school, and the United States land office.

It has city water and electric lights. The City Hall cost $20,000.00.



Group of Public Buildings.

Last year the city expended $125,000.00 on permanent improvements and nine business houses were erected at a total cost of $150,000.00. The shops of the Great Northern Railroad are located at Havre, giving the city a large pay-roll. In the vicinity of the city are large deposits of lignite coal and of the best grade of natural cement. Tributary to Havre there are one million and a half acres of land, a large percentage of which is bench land with a soil that is very fertile and many feet in depth.

Chester.

Chester is on the Great Northern Railway and has a population of 800. The city has a brick factory, one elevator with a capacity of 25,000 bushels, two large hotels, two banks, seven retail stores, a Commercial Club, one public school and a live newspaper, the Chester Signal. Chester has long been the trading point for the country of the famous Sweet Grass hills, the tributary territory embraces more than a million acres of the very finest agricultural lands. The largest experimental farm along the Great Northern is located at Chester and this year demonstrated the ability of the land to produce crops under the most adverse conditions. The town has recently been incorporated and public improvements are being planned. Last year 300 buildings were erected at a total cost of $75,000. The publicity given by the newspaper and the activity of the business men have built the town from 100 people in 1909 to 800 in 1910. Fuel is cheap and the city offers a good opening for cement blocks and brick factories and invites investment of capital in permanent city improvements and the construction of an electric railway to tap the Sweet Grass Hills country.

CUSTER COUNTY.

Custer County lies in the extreme southeastern part of the State and has and area of 12,915 square miles. The name of the county is in memory of General Custer who fell in heroic battle at the Big Horn in 1876. It has a population of 14,123* and an assessed valuation of $17,577,709.00 in 1910.

It has a county high school located at Miles City and 66 public schools with property valued at $15,539.00 and last year the County spent $97,075.42 for school purposes.

The chief industries in the county at present are livestock, wool growing and agriculture. Corn, tomatoes and melons are grown in large quantities and horticulture promises to be an important industry in this county in the future.

Lignite coal exists in very large quantities throughout a large part of the county. It has a great variety of undeveloped resources and will in the course of time become one of the wealthiest portions of Montana. The State Reform School is located at Miles City.

Miles City.

Miles City is the county seat of Custer County. It is located on the Northern Pacific and Chicago, Milwaukee & Puget County Railways, and it has a population of 6,500. The city has three banks, two clubs, two first-

class hotels and a number of smaller ones, 28 business houses, four churches, one hospital, two public schools, one high school, Carnegie Library and a Catholic Convent.

It has four manufactories, consisting of sash, door and blind, wood-working, tin works and saddlery and harness. It also has one elevator and owns the water works system and electric plant which are operated very successfully by the city and bonds for the amount of $250,000.00 have been voted for the improvement and extension of these plants. The city has three newspapers.

Dry Farm Dent Corn.

Miles City is a splendid distributing point for a large area of country extending 150 miles in all directions. Fuel is cheap and water power abundant. The city offers good opportunities for the investment of capital in a creamery, a canning factory, a woolen mill and wholesale houses.

Baker.

Baker is on the Chicago, Milwaukee & Puget Sound Railway, and has a population of about 200. It has one bank, one church, one hotel, one shearing plant, five business houses and is a growing little town.

Ekalaka.

Ekalaka is the metropolis of the southeast portion of the county and has a population of about 400. Its transportation is furnished by three automobile lines and a daily stage to Baker, the railroad shipping point.

Dry Farm.

It has one hospital, one church ,two banks, three hotels and a number of business houses. The school building cost $9,000.00. Ekalaka is probably the best "cow town" remaining in the west. It is in the heart of the great range country where the climate is mild and livestock winters with very little loss. The soil is a black sandy loam, producing the most nutritious grasses. Fuel is cheap for there is an abundance of timber and the country is underlaid with deposits of lignite coal.

It has a newspaper and a commercial club.

Young Orchard Near Miles City.

Ismay.

Ismay is on the Chicago, Milwaukee & Puget Sound Railway, and has a population of 175. It has electric lights, one bank, one hotel, one church, a newspaper, a shearing plant and is an important shipping point for live stock and wool.

Terry.

Terry is an incorporated town on the N. P. and C. M. & P. S. Railways, and has a population of about 500. It has one bank, one church, a newspaper, two hotels, two general stores and is a prosperous and growing place.

Plevna.

Plevna is on the C., M. & P. S. Railway and has a population of about 100. It has one school, one bank, one hotel and one general store. It is a new town and has become an important shipping point.

DAWSON COUNTY.

Dawson County lies along the eastern border of the state, has an area of 13,076 square miles and a total assessment of $7,965,189.00. The population is 12,725*, showing a yearly increase of more than 1,000 since 1900 when it had only 2,443 inhabitants.

This county is the eastern gateway to Montana and is a land of vast cattle ranges and a great producer of wool. Its large fertile valleys are

Group of Public Buildings.

sheltered by the foothills and are being filled rapidly with comfortable homes and improved farms. The Missouri River forms its northern boundary and the Yellowstone crosses the eastern part of the county making conditions favorable to the success of large irrigation projects, (which are described in a separate article.)

The proposed line of the Great Northern from Mondak to the west, will open up a large territory which has not been settled because of the distance from a railroad.

The county has a high school located at Glendive, and 59 public schools having property valued at $92,255.00 and last year the county expended $52,354.00 for school purposes.

Glendive.

Glendive the county seat is flourishing young city with a population of 3,500. It is an important division point on the Northern Pacific Railway, and the monthly-payroll of the yards and shops is $40,000.00. The new Glendive-Mandan road, which will traverse the lower Yellowstone is now under construction and will contribute largely to increase of the wealth of the city. It has an electric light plant, municipal water works, three newspapers, public schools and commercial houses representing every line of trade.

The county buildings and the county high school are located here. The Northern Pacific Railway has a plant here for the manufacture of re-inforced concrete piers and slabs for bridge work and a state experimental farm is located north of Glendive.

Sidney.

Sidney is situated in the northeastern part of the county at the confluence of the Lone Tree Creek with the Yellowstone River. Though in its infancy it can boast of a population of 500 and has a steady growth. It has one school, a newspaper (The Sidney Herald), three churches, two banks, a commercial club, fifteen retail stores and one elevator with a capacity of 30,000 bushels.

"We Sure Like Montana!"
By Permission of L. A. Foster, Glendive, Montana.

Fuel is cheap and it is possible to develop 180,000 H. P. from the Yellowstone River. Sidney has an electric plant. The Northern Pacific has a branch line from Glendive to Sidney. The Government has spent more than $3,000,000.00 in the construction of an irrigation project in the valley of which Sidney is the metropolis.

Farming and stock raising are carried on extensively. The business transacted in Sidney is greater by far than in other places many times its size and the indications are that it will more than double in population during the next year. Sidney offers good openings for a flour mill and a brick factory.

Wibaux.

Wibaux is on the Northern Pacific Railway, and centrally located in the rich Beaver Valley, six miles from the North Dakota line. It has a population of about 500, a graded and high school, three churches, two banks, two newspapers, three elevators, two hotels, four retail stores and the principal industries are grain and livestock, with a tributary territory developing rapidly in agriculture and horticulture.

Fairview.

Fairview is located in the Northern part of the county at the North Dakota line with a population of 250. It has four general stores, two banks, one church and a public school and newspaper, a hotel, a flour mill and an Opera House. Fairview is one and one-half miles from the Yellowstone River and is in the midst of a growing community.

Savage.

Savage is on the new line of railway about half way between Glendive and Sidney and has a population of about 250. It has a public school, a newspaper, two hotels and three general stores.

Small fruits do exceedingly well in the vicinity and the section including Savage, Sidney and Fairview comprises the principal feeding grounds for livestock before making shipments.

DEER LODGE COUNTY.

Deer Lodge is one of the smallest counties in the State, having an area of only 726 square miles.

The population is 12,988* and the assessed valuation of the county is $3,707,003.00.

The county contains valuable deposits of coal, marble, fire clay, gold, silver and lead with a number of rich mines developed. Its mountains are covered with timber and its agricultural lands are very productive. Large quantities of hay, wheat, oats and vegetables of all kinds are produced. The county has a good record for prizes awarded at state and county fairs.

No better showing has been made by any section in the matter of raising thoroughbred Herefords and Holsteins. The cities of Butte and Anaconda furnish good markets for all farm products.

Three lines of railway traverse the county, affording good transportation facilities. The State Fish Hatchery is located at Anaconda and the State Insane Asylum is located at Warm Springs.

There are 23 public schools in the county having property worth $211,824.00 and last year the county expended $60,160.00 for school purposes.

Anaconda.

Anaconda the county seat of Deer Lodge county is located on the Butte, Anaconda & Pacific Railway, and has a population of 10,124.*

It is especially favored with respect to its water supply and lighting system, electric car service, sewer system, fire defense and public buildings.

The city in every respect has transcended the wildest dreams of the pioneers who staked out the little camp in 1883.

It has a fire-brick plant, the product of which is acknowledged to be the best in the world, a foundry consisting and boiler shops and an electrical department. The foundry employs 175 men. It has one daily and two weekly newspapers, seven churches, the Hearst Free Library, two hotels, two banks and a large number of commercial houses, representing all lines of business.

For pleasure grounds the city has the "Common" with a band stand and a baseball ground which occupies one whole block in the center of the city and the "Washoe Park" west of the city, containing a beautiful lake, a magnificent dancing pavilion and other summer resort facilities.

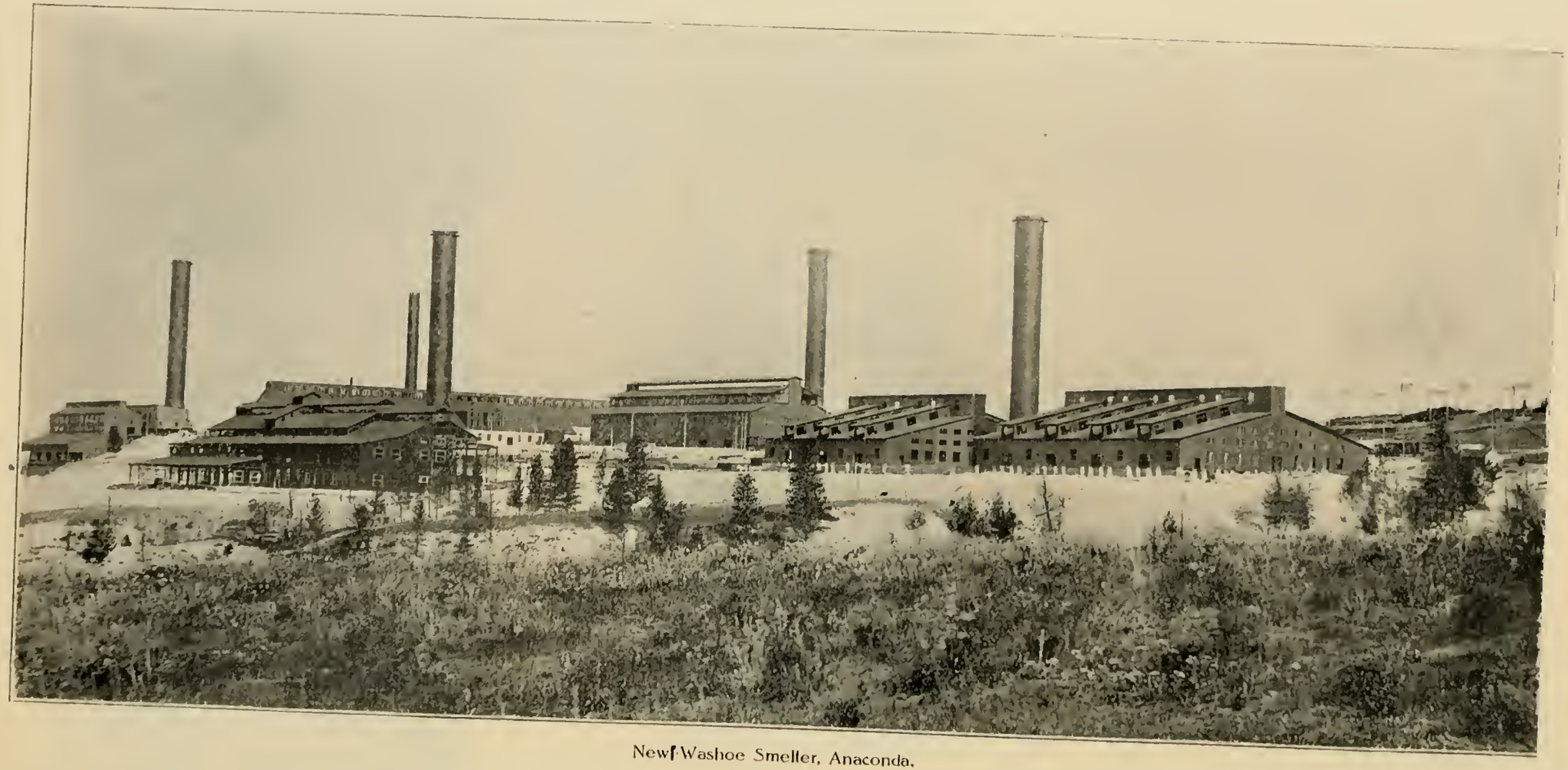
The Washoe Park is connected with the city by convenient street car service.

Deer Lodge County High School.

The new Washoe smelter is the largest and most modern smelting plant in the world, treating 15 per cent of all the copper produced in the world and 25 per cent of all the copper produced in the United States. The smelter employs 2,000 men and has a monthly pay-roll of $215,000.00. It was erected at an enormous cost amounting to more than $9,000,000.00. The human mind can scarcely grasp the gigantic operations of this great smelter which requires to feed its maw the following material every 24 hours:

Amount of ore	10,000 tons
Lime rock	2,300 tons
Coke	650 tons
Coal for reverberatory	500 tons
Coal for power	500 tons
Water per minute	35,000 gallons

The State Fish Hatchery is located at Anaconda. Anaconda is a modern city of splendid blocks, of well kept streets and attractive homes. The development of the public schools has kept pace with the rapid growth of the city. The city high school is one of the best in the state and the



New Washoe Smelter, Anaconda.

A Dairy Herd in Deer Lodge Valley.

building would be a credit to any city. The public schools have modern buildings with every known comfort and convenience. The County Court House is a magnificent structure built of stone and is a splendid specimen of modern architecture.

The Montana Hotel was built at a cost of $200,000.00 and is provided with every modern convenience. The country tributary to Anaconda is undergoing rapid development; to the west, a rich mining district is attracting large capital and the agricultural and stock raising industries are rapidly increasing the wealth and growth of the city.

FERGUS COUNTY.

Fergus is the central county of the state and has an area of 8,892 square miles with an assessed valuation of $16,887,276.00, making the present wealth of the county three times as much as it was ten years ago.

The population of the county is 17,385.* The Fergus County High School is located at Lewistown. The county has also 83 public schools with property valued at $162,210.00, and the county paid for school purposes last year $97,847.00.

The distance across the county north and south is 110 miles and the length of the county east and west is 125 miles. These figures will give the reader some idea of the vast extent of the "Inland Empire."

The resources of Fergus are extensive and varied. Its mountains filled with mineral deposits, its broad benches and large valleys, famous for the depth and richness of their soils, its crystal mountain streams, broad majestic rivers and forest crowned hills will always make Fergus a land of plenty and prosperity.

For many years Fergus has led all the other counties of Montana, in the production of gold and is above the average in livestock and agriculture.

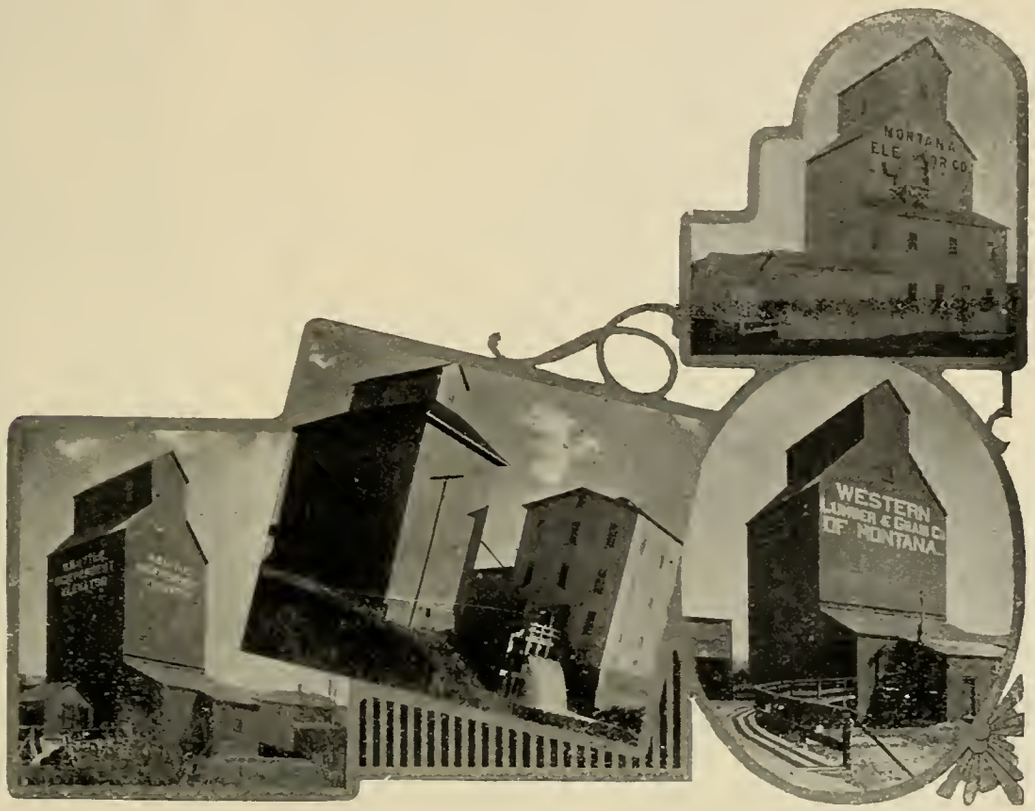
Lewistown.

Lewistown is the county seat of Fergus county and is located on the

Chicago, Milwaukee & Puget Sound Railway. The city has a population of 4,000. It has one hospital, six churches, three banks, one club, three hotels, six wholesale houses and fifty-four retail stores.

Last year the city spent $40,000.00 on permanent improvements and ten business blocks and thirty residences were erected, the business blocks costing $375,000.00.

It has city water works, an electric light plant, four grain elevators with a capacity of 100,000 bushels, two telephone systems, two telegraph lines, one daily and two weekly newspapers, an immense wool warehouse, large



Elevators at Lewistown.

machine shops, a modern flour mill, a foundry, a brewery and three cigar factories.

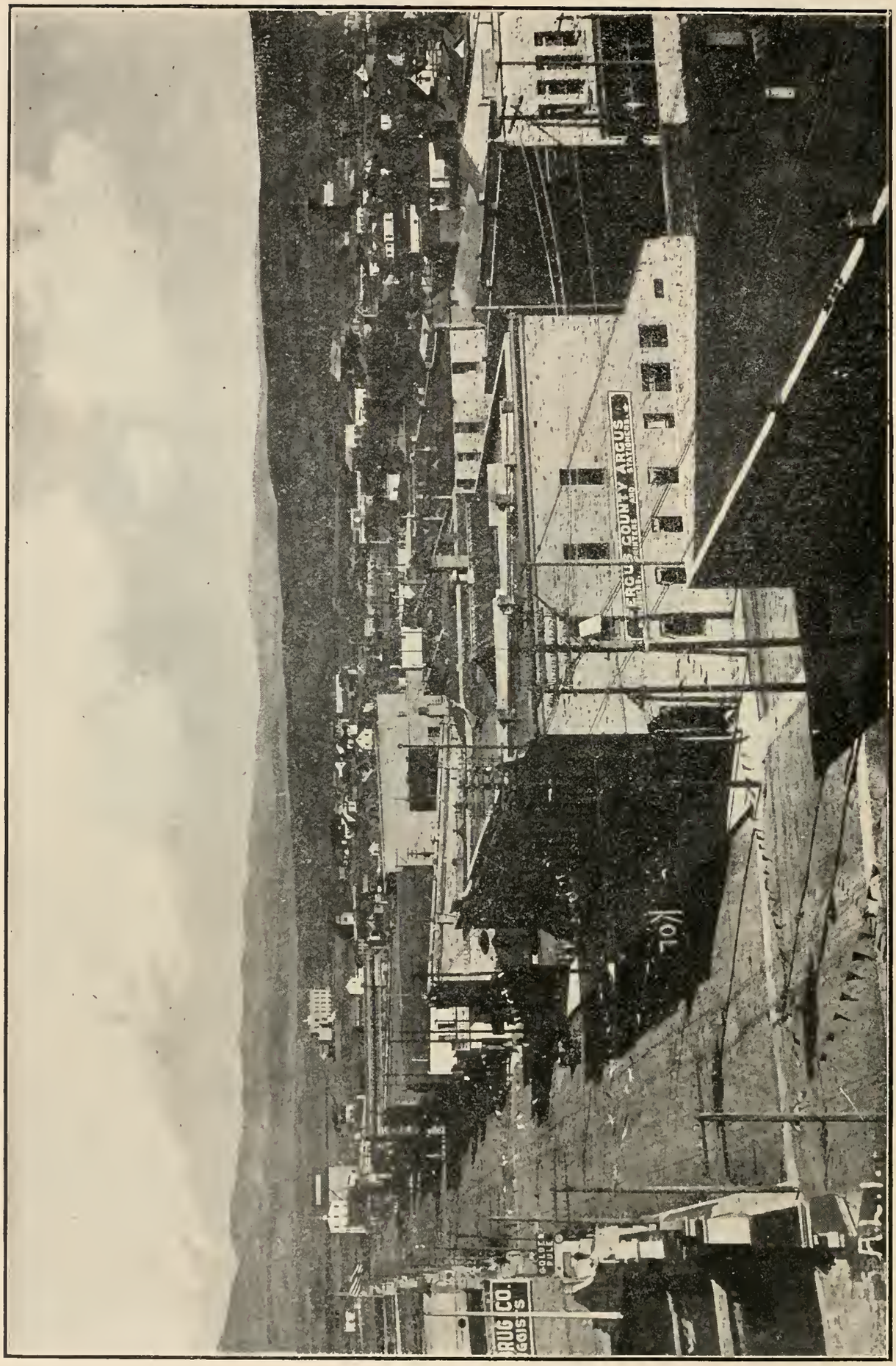
Lewistown has three public schools, one high school also one parochial school. The City Hall cost $12,000.00, Masonic Temple $50,000.00, Hospital $35,000.00, Public Library $15,000.00 and Court House $130,000.00.

Seven hundred horsepower has been developed and it is estimated that there is water power available for an additional 3,500 H. P. Fuel is cheap, the coal being mined within a few miles of the city.

Lewistown is the supply point for Gilt Edge and Kendall, the richest gold producing district in the state. The tributary territory embraces more than a million acres of land so productive that the farmers are the most prosperous men in the county.

Moore.

Moore is an incorporated town on the C., M. & P. S. Ry., with a population of about 800. It is the center of the great wheat belt of the Judith Basin and is well supplied with mercantile houses, so that the needs



Lewistown.

of a busy, growing and prosperous agricultural community are amply supplied.

It has two banks, whose deposits aggregate $500,000.00, three grain elevators with a total capacity of 275,000 bushels, three lumber yards, three machine and blacksmith shops, two automobile garages, two telephone exchanges and two newspapers. It also has a cement, brick and block factory, whose products are of superior quality and have been used in the construction of numerous buildings. A large modern hotel is under construction which will cost $30,000.00. A two story cement-brick high school building has just been completed at a cost of $12,000.00.

It has one graded school, three churches, (Catholic, Christian and Methodist), electric lights, graded streets, and is preparing to install water works.

Fergus County Court House.

Hobson.

Hobson is on the Great Northern Railway, and has a population of about 400. It has one school house which cost $10,000.00, one church, two banks, one club, three hotels, nine retail stores, one newspaper and two ele-

vators with a capacity of 30,000 bushels. It has a cement block factory and a planing mill. Last year 21 new houses were built at a total cost of $75,000.00. Fuel is cheap and waterpower can be easily developed.

Stanford.

Stanford is on the Great Northern Railway, and is just one year old with a population of about 400 and rapidly growing. It has two hotels, one bank, one newspaper, one club, one church, one school, three general stores, one brick plant and two elevators with a capacity of 700,000 bushels. The estimated cost of the buildings constructed is $500,000.00. Fuel is extremely cheap.

Stanford can take care of a flour mill which is very much needed, for it is the natural commercial center of an area embracing 500,000 acres of the choicest farming land.

Kendall.

Kendall is an important mining town and has a population of about 1,200. The transportation is by stage to Lewistown, the shipping point. It has one school, one hospital, one church, one bank, three hotels, eleven retail stores and electric lights. Fuel is fairly cheap, 700 H. P. has been developed and there is water power available for possibly 700 more.

The famous Kendall and Barnes-King gold mines are in the vicinity.

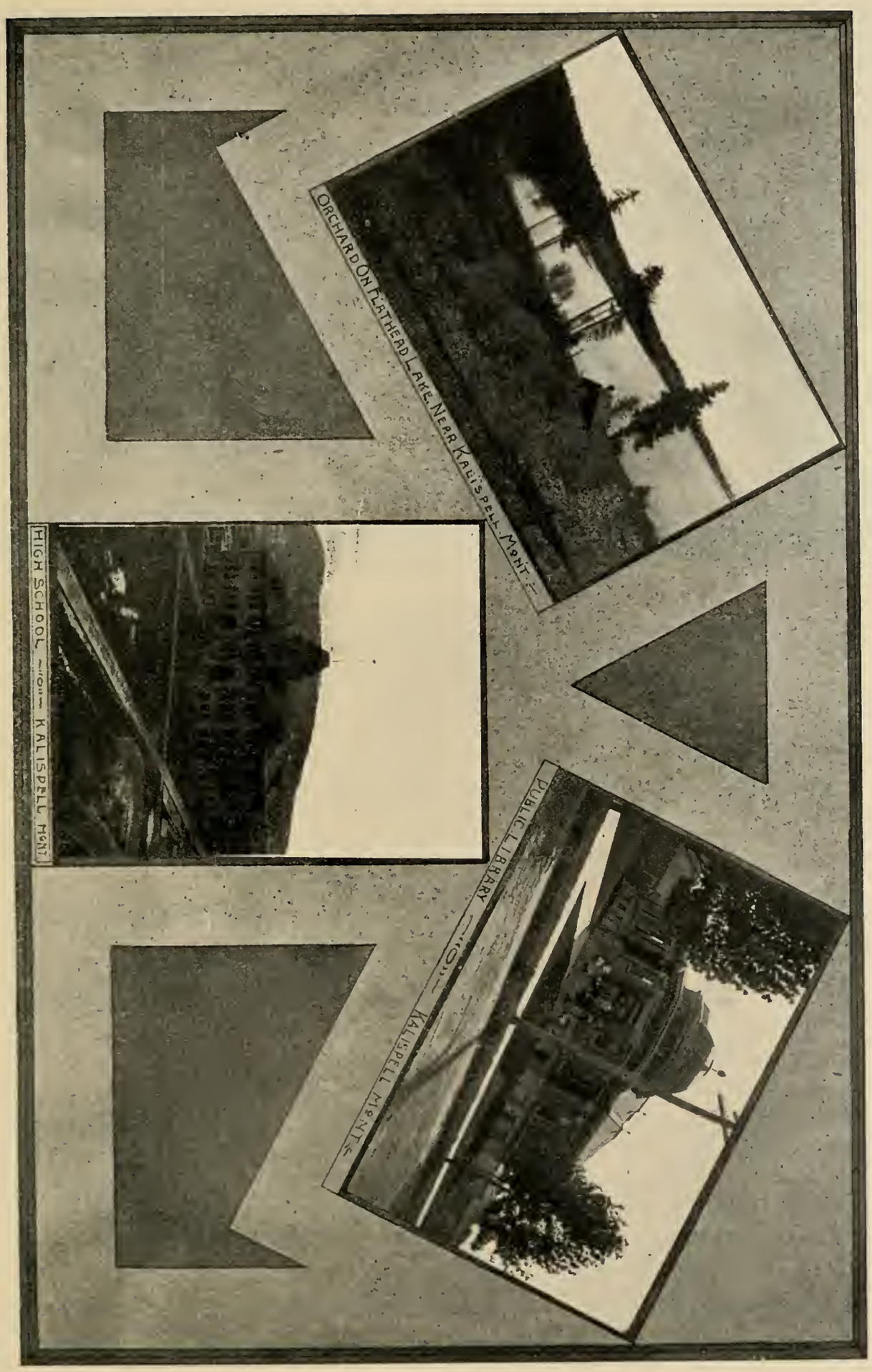
FLATHEAD COUNTY.

Flathead County has a population of 18,785* and an assessed valuation of $9,845,105.00. The county high school is located at Kalispell. The county has 50 public schools with property valued at $195,165.00 and spent $112,132.79 last year for school purposes. The state Soldiers' Home is located at Columbia Falls. The county is located in the northwestern part of the state and lies along the Pacific slope of the Rocky Mountains. The protection afforded by this location renders the climate very mild for a northern country and the winters are free from blizzards and low temperatures. The snow falls throughout the entire winter are abundant and the snow lies on the ground about four months of the year, affording protection to winter wheat and aiding in the extensive logging operations of that district.

The Flathead Valley contains about 250,000 acres of arable land and produces annually about 1,000,000 bushels of oats, 800,000 bushels of wheat and 20,000 tons of hay.

Flathead County is not a cattle country as the land is too valuable for range purposes. No irrigation is practiced for the rainfall is sufficient to mature crops. Lumbering is one of the most important industries, the annual cut of the district is about 125,000,000 feet or over 4,000 car loads. There are more than 2,000 men employed in the lumbering industries and the annual pay-roll amounts of $1,200,000.00. This lumber finds ready market throughout eastern Montana, the Dakotas and Nebraska. There are about 40,000,000,000 feet of standing timber in the district.

Fruit growing is one of the chief industries and a great many people



Group of Public Buildings.

of the rural population are becoming wealthy from this industry. Apples are the leading crop. Plums, peaches, pears and cherries are also raised and shipped east in large quantities. The fruit district centers largely around the Flathead Lake, which is the largest body of fresh water west of Lake Michigan. It has an area of 350 square miles and is surrounded by prolific farms and orchards with a back ground of scenic mountains. The area of the county is 6,339 square miles.

Kalispell.

Kalispell is the chief banking and marketing city in northwestern Montana. It has 5,549* people and is growing quite rapidly. There are four banks with a combined capital of $400,000.00 and deposits amounting to $2,500,000.00. The wholesale houses supply the local territory from Havre to the Idaho line and from the international boundary to the southern end of the Flathead Lake. The residence portion is all boulevarded and cement sidewalks have been laid on all the avenues.

A complete sewer system affords most excellent sanitation and up-to-date water and electric light systems have been established. The city is surrounded by several fine water power locations, one of which has been developed by a large corporation and furnishes 10,000 H. P., which is used to a great extent by local factories.

Three large brick grade schools and a modern high school afford exceptional educational facilities.

Kalispell is rapidly becoming a most desirable residence city and is securing quite a population of wealthy cattle and sheep men who desire comfortable homes where educational and social advantages are to be had. The recent creation of the Glacier National Park which lies largely within Flat-

head County, is attracting many touristsand its business is becoming a source of considerable profit to the local merchants and hotels. Last year the city spent $75,000.00 on permanent improvements and 700 new buildings were erected at a total cost of $1,200,000.00. The city has four elevators, one creamery, one flour mill with an annual output of 120,000 bbls., one hospital, eight churches three newspapers, one club, four hotels, six wholesale houses and sixty other business houses. The manufactories consist of saw-mills, planers, sash and door, foundry, mattress, brewery and Kalispell can take care of any kind of factory where cheap power is an object.

The City Hall cost $14,000.00, the Public Library $10,000.00 and the Court House $75,000.00. Kalispell is located on the Great Northern Railway, and is the terminal of the branch lines running west to Marion and south to Somers at the head of the Lake.

The prospect of railroad activities in this district is another indication that the population of Kalispell will be materially increased within the next few years.

Columbia Falls.

Columbia Falls is beautifully located on the banks of the Flathead river and is at the junction point of the main line and the Kalispell branch of the Great Northern.

It has a population of about 1000 with one bank, two hotels, a newspaper, twenty-two retail stores, two churches, (Catholic and Methodist), and two public schools which cost $51,000.00. It is the seat of the State Soldiers' Home, which has a hospital that cost $30,00.00 and other buildings costing $100,000.00.

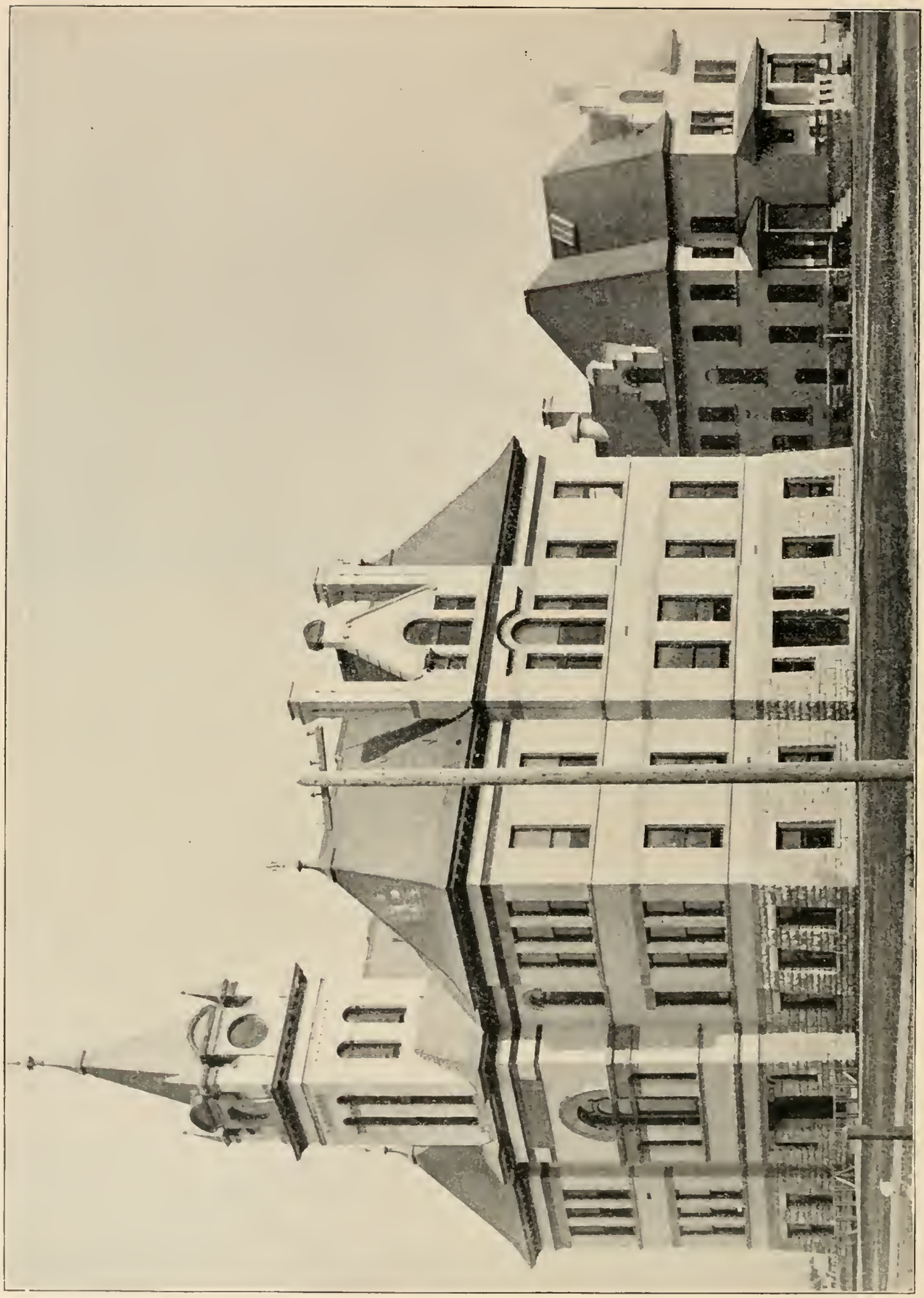
The town is newly incorporated and has just expended $2,500.00 on improvements. It has water works and electric lights. There are great possibilities in the matter of water power, one dam would develop 30,000 H. P. and other dams would multiply these figures.

There are six saw and planing mills within a radius of five miles. Columbia Falls could take care of wood pulp, cereal mills and cereal food factories. Fuel is cheap and tributary to the town is 20,000,000 ft., of matured merchantable timber including 6,000,000 ft., of white spruce (pulp wood). There were 500,000 bushels of wheat, oats and barley produced this season in the vicinity and as an additional resource there are large deposits of coal.

Whitefish.

Whitefish is located at the northern end of the famous Flathead Valley on the main line of the Great Northern and has a population of about 2300. It was cut out of the virgin forest seven years ago and now has three large brick blocks besides a large number of houses representing the best lines of business.

Whitefish has an electric plant with current sufficient for lighting and industrial purposes, a municipal water plant with the cheapest water in the state, cement sidewalks in the business section which are being extended to the residence districts.



Court House and Jail, Kalispell.

It has a first class school, three churches, public hall, a theatre and four hotels, a sanitary sewer system is being installed. There are two saw-mills in town and others in the vicinity. Whitefish is an important division point on the Great Northern and has a round house and repair shops with a monthly pay-roll of more than $100,000.00.

The town is situated on the Whitefish Lake, a beautiful body of water, seven miles long with several fine resorts and there are 50 motor boats on the Lake. The industries are agriculture, horticulture, lumbering and railroading.

Polson.

Polson is the largest town on the old Flathead Indian Reservation, beautifully located at the foot of the Flathead Lake. It has a population of about 900. Last year 100 new buildings were erected at a total cost of $50,000.00.

It has city water works and electric lights. The transportation consists of two steam boat lines to Somers and stages to Ravalli and Dixon. The town has a public school, Catholic and Methodist churches, three banks, three clubs, five hotels and twenty-five business houses.

The manufactories consist of a saw-mill, cabinet works, brick works, cement blocks and pop factory. The town is growing rapidly and combines beautiful scenery, fine climate and commercial activities.

The surrounding country is being rapidly settled with farmers and fruit growers. Its best asset however, is its location for manufacturing purposes, being at the foot of the lake and the natural outlet for all timber on the Flathead system, estimated to be about 50,000,000,000 ft. There is a large water power on the Flathead river in the vicinity, having a total fall of about 200 ft., at low water and a flow of 2,500 second feet which would furnish sufficient water power for large factories.

On Flathead Lake.

Other important towns along the shores of the Flathead Lake are becoming prosperous including Somers at the head of the Lake, Big Fork on the eastern side and Dayton on the west.

GALLATIN COUNTY.

The county lies in the south central part of the state and comprises an area of 2,352 square miles, has an assessed valuation of $13,686,579 and a population of 14,479.*

The Gallatin Valley was named "The Egypt of America" by Professor Hayden because of its great productiveness. It is here that agriculture

has reached its highest development in the State. Vast crops of grain and hay are grown, and their superior qualities command for them the highest market prices.

The valley is an old lake bed of great fertility and the land surface has the right slope for drainage. It has an abundant supply of water from the east and west forks of the Gallatin, the Madison and Jefferson Rivers, all of which unite to form the Missouri in the northern part of the county.

Transportation is furnished by the Northern Pacific and the C. M. and P. S. Railways and the Gallatin Valley Electric Railway. The Montana Agricultural College, the State Experimental Station, U. S. Land Office and the United States Fish Hatchery are located at Bozeman.

Gallatin was the first county in the State to establish a County High

Catholic Church, Central School and County High School at Bozeman.

School. It has 59 public schools with property valued at $226,538 and last year the sum of $79,931.56 was expended by the county for school purposes.

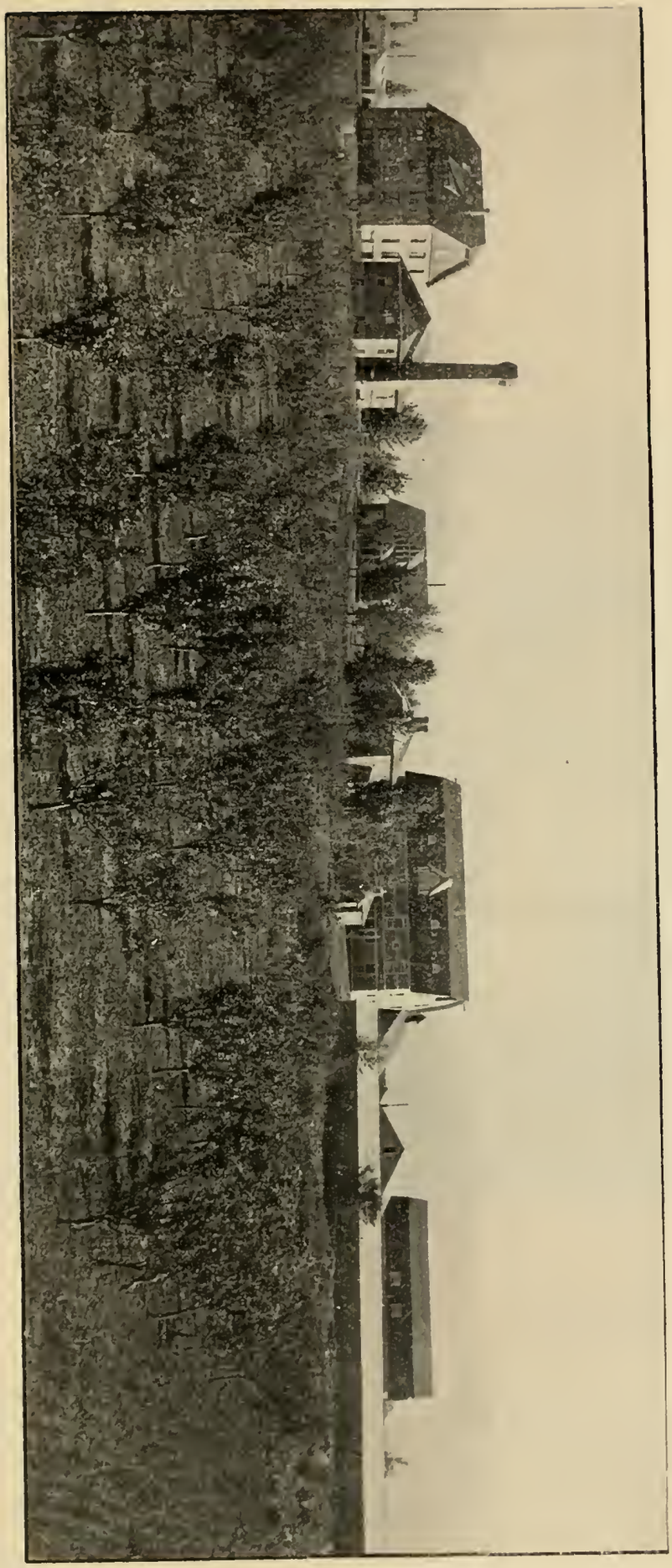
Bozeman.

Bozeman the county seat is on the Northern Pacific Railway and has a population of 5,107*. It has electric railway connections with other important points in the county and water power in the vicinity, with at least 50,000 horse-power available. The city spent $75,000 on permanent improvements last year and 80 buildings were erected at a total cost of $400,000.

It has a foundry and machine shops, 2 sash and door factories, cement block and cereal factories, a gas plant, brick factory, 5 elevators with a combined capacity of 585,000 bushels, 2 flour mills with a daily capacity of 650 barrels and a creamery with an annual output worth $50,000.

The City Hall cost $50,000, Library $20,000. The city has a private Commercial School and is the seat of the Montana Agricultural College which occupies a number of imposing buildings on an eminence southwest of the city.

The Sweet Pea Carnival is an annual celebration peculiar to Bozeman which every year attracts a large number of visitors.



Montana Experiment Station, Bozeman.

Bozeman can claim supremacy in so many different features that in attempting and honest portrayal of the town, one is embarassed with its wealth of attractive points, each of which seems to be pre-eminent. Its location is certainly ideal, lying as it does at the southeast end of the Gallatin Valley with the Bridger Mountains, the Gallatin Range and several other towering ranges at a distance from two to ten miles. These picturesque mountains and peaks form a background to the landscape no matter in which direction one looks.

While Bozeman is the oldest settlement in eastern Montana, it is thoroughly up-to-date and modern in every way, its business blocks are as substantial and handsome as those of any town of its size in the country.

Main Street, Bozeman.

It is compactly built and the townsite is fairly level with just enough slope to insure perfect drainage. Bozeman in the language of a commercial traveler who is partial to the place, is, "the biggest little town of its size you ever saw." A trolly line that gets its power from the Madison River connects the depot with the town and college and makes transportation between its extreme ends an easy matter. Bozeman is distinctively a city of schools, homes and churches; and the citizens take great pride in maintaining handsome residences and adequate grounds. There are many modern and costly homes with grounds in complete harmony with the character of the buildings.

The Interstate Fair is one of the recognized institutions of the town and its exhibits and displays in every department are so varied and marvelous that visitors are attracted from all parts of the state. The association has adequate buildings, grand-stands and a mile track, and its grounds are located inside the city limits within an easy walk from the depot.

The business part of the town is compactly built and occupies five or six blocks along Main street, and about one block on each side of several cross streets. The handsome buildings, electric car lines, cement walks, and daily crowds of shoppers testify to a prosperous conditions which prevail. Bozeman boasts of some of the finest stores and store buildings in

Montana Agricultural College.

the state, almost every line of trade being represented. It has two private hospitals, both occupying commodious buildings and spacious grounds. Its free school system utilizes four school buildings of modern type. The county high school gives the children from the country the same educational advantages enjoyed by those living in town. Bozeman also has a first class hotel down town, a number of smaller hotels and apartment houses, municipal water works and sewer systems, an electric light and power plant, 24 miles of cement sidewalks, 2 newspapers, fine public buildings, a free public library, 9 churches, 2 social clubs, 2 telephone exchanges, 4 banks, a mail carrier system and rural free delivery, a fire department and all of the other complements of an up-to-date community.

Bozeman is growing rapidly and steadily because its prosperity is based on solid merit and it offers to the homseeker the very conditions most desired. Its business men are making an organized effort to settle up the tributary country more closely and are offering inducements to honest and legitimate manufacturing enterprises to locate here. With its tremendous water-power, its splendid home market and its central location, Bozeman is destined to become an industrial as well as an agricultural factor in this state.

Belgrade.

Belgrade is in the center of the Gallatin valley and draws the trade of the farmers from all points of the compass. It is located on the Northern Pacific Railway and has a population of about 600.

After the first grain elevator was built here the town began to grow and it has been growing ever since. It has a fine municipal waterplant; electric light and power in unlimited quantities; four grain elevators with a combined capacity of 800,000 bushels; a flour mill with a capacity of 300 barrels per day, a school building which cost $20,000, a hospital, Baptist, Methodist and Presbyterian Churches, a newspaper, one bank, one hotel, and five retail stores.

Last year four miles of cement sidewalks were built and 15 buildings were erected at a total cost of $60,000. Belgrade is a growing town and is said to be the largest initial grain shipping point in the country.

Manhattan.

Manhattan is on the Northern Pacific Railway and has a population of about 400. The town is surrounded by one of the richest farming districts in the northwest. It has graded schools, two churches, one newspaper, one bank, three hotels, seven retail stores, two clubs, three elevators with a capacity of 350,000 bushels, a new flour mill just completed, a large malting plant, a paper mill and is lighted by electricity. Last year 28 new buildings were erected at a total cost of $50,000. A deposit of beautiful onyx has been found four miles north of the town.

Three Forks.

Three Forks has a population of 1,000 and is charmingly located between the Jefferson and Madison Rivers, having received its name from the three-fold confluence forming the Missouri.

It is on the main line of the Northern Pacific and is a division point on the Milwaukee where the dispatchers, train crews, roundhouse, repair shops and other employes make their homes.

It has two school buildings, two banks, five hotels, five retail stores and a live commercial club. The town has electric lights and a gravity water works system is under way.

An electric railway which connects Three Forks with Bozeman and other important points in the Gallatin Valley will probably be extended to the Yellowstone Park for the benefit of the tourists of the Milwaukee.

Three Forks is a geographical center of a vast area of first class agricultural land and has in the vicinity large deposits of glass and molding sands, brick and pottery clays; and materials for making cement. The above resources with the immense water power available make Three Forks a desirable location for many kinds of manufactories.

GRANITE COUNTY.

The area of Granite County is 1,617 sq. miles, the population is 2,942* and the total valuation for assessment purposes is $3,174,597.00. The county received its name from the famous Granite mountain silver mine.

Some of the first settlements in Montana were made in this County. Its mineral products are the leading sources of wealth. Farming and livestock are important industries. Timber is convenient for fuel and other purposes. The water supply is abundant.

Grain, hay, fruits and vegetables are produced in the valley. Winter wheat does remarkably well without irrigation. The lands are fertile and yields are good. Gold, silver, lead and sapphires have produced millions of wealth and Granite County's rich deposits will not be exhausted for many years. The rate of taxation is low and the criminal business it at the bottom of the list.

Granite County has a high school located at Philipsburg, which is well equipped for most efficient work. The county has 24 public schools with school property valued at $39,834.00 and last year the sum of $13,489.00 was expended for school purposes.

Harvest Field.

Philipsburg.

Philipsburg, the county seat has a population of 1200. Its commanding position upon the upper terrace of the Flint Creek Valley, at the base of the great range, makes it a noticeable feature of the landscape. It has excellent drainage, pure mountain water, led from a granite water shed through a gravity system, under heavy pressure, into every home and business house; a perfect electric lighting plant, beautiful homes, with handsome shade trees and well kept lawns about them.

Churches of the principal denominations, numerous mercantile establishments, first-class hotels and cafes, one bank, a brewing plant, a newspaper, a public school and also a county high school afford advantages to the citizens of Philipsburg.

The county buildings are located here and are adequate for the needs of the public. Philipsburg is an important shipping point and the terminal of a branch line of the Northern Pacific.

Drummond.

Drummond is on the Northern Pacific and C. M. & P. S. Railways, and has a population of about 300. The town has one public school, one church, two hotels and a number of mercantile houses. It is the business center of the northern part of the county and affords all the conveniences of a modern country town. Fuel is cheap and there is water power available.

Dry Land Cabbage.

Hall.

Hall is a village on a branch line of the Northern Pacific, noted as being the "Spotless Town" of Montana being one of the few "dry" towns in the west. Already it has two large general stores, a large up-to-date creamery, lumber and stock yards and other lines of business. It controls a large trade from the Willow Creek Valley.

Lignite coal mines are within easy reach and fuel is cheap.

JEFFERSON COUNTY.

The county has an area of 1,613 sq. miles, the greater part of which is mineral land. The total assessment amounts to $5,886,153.00 and the population of the county is 5,601*. The Boulder, Jefferson and Prickly Pear are the principal valleys with fine agricultural lands and the farmers have good markets for all their products. Timber is abundant for fuel and building purposes. Elkhorn, Boulder, Basin Whitehall, Corbin, Wickes, Warm Springs, Clancy and Lump Gulch are the principal mining districts.

The famous Hot Springs at Boulder, Pipestone and Alhambra all have modern improvements and receive many visitors. The natural resources are sufficient to make Jefferson one of the richest counties in the state.

The county has a high school at Boulder and 24 public schools. The public school property is valued at $69,528.00 and last year the county expended $40,644.00 for school purposes.

Boulder.

Boulder is the county seat and has a population of 800. It is situated on the Great Northern Railway, in the central part of the county, and is the home of the State School for the Deaf, Blind and Feeble Minded. It has a public school and free County High School, four churches, one newspaper, one bank, two hotels, many commercial houses and restaurants, It is noted for its fine gardens, green lawns, shade and fruit trees and fine residences.

The principal industries are mining and agriculture.

Whitehall.

Whitehall is the metropolis of the south end of the county and is on the Northern Pacific Road about two miles from the Jefferson River with a population of about 500. Last year six new buildings were erected at a total cost of $40,000.00. It has electric lights, one public school, one high school, two hospitals, two churches, one bank, a commercial club, three hotels and ten business houses.

Basin.

Basin, with a population of about 500 is on the Great Northern Railway. The Heinze Mill and Reduction Works are located here. The town

Town of Elkhorn.

has one public school, one church, one bank, five general stores and a brewery. The principal industry is mining. Fuel is cheap and Basin has water works, electric lights and water power for the same.

Clancy.

Clancy is on the Great Northern Railroad, the railroad division point, the center of a prosperous mining and agricultural district.

It has one school, one church, a general store and a number of restaurants and lodging houses. The population including Alhambra and the Sunnyside Hot Springs is about 600.

Elkhorn.

Elkhorn with a population of 400 is situated in the mountains at an altitude of 6000 feet and is the terminal of a branch line of the Northern Pacific. It has mills and reduction works and is the home of the famous Elkhorn group of mines. It has a church, a public school and a number of commercial and boarding houses. Elkhorn is one of the important markets and shipping points of the county.

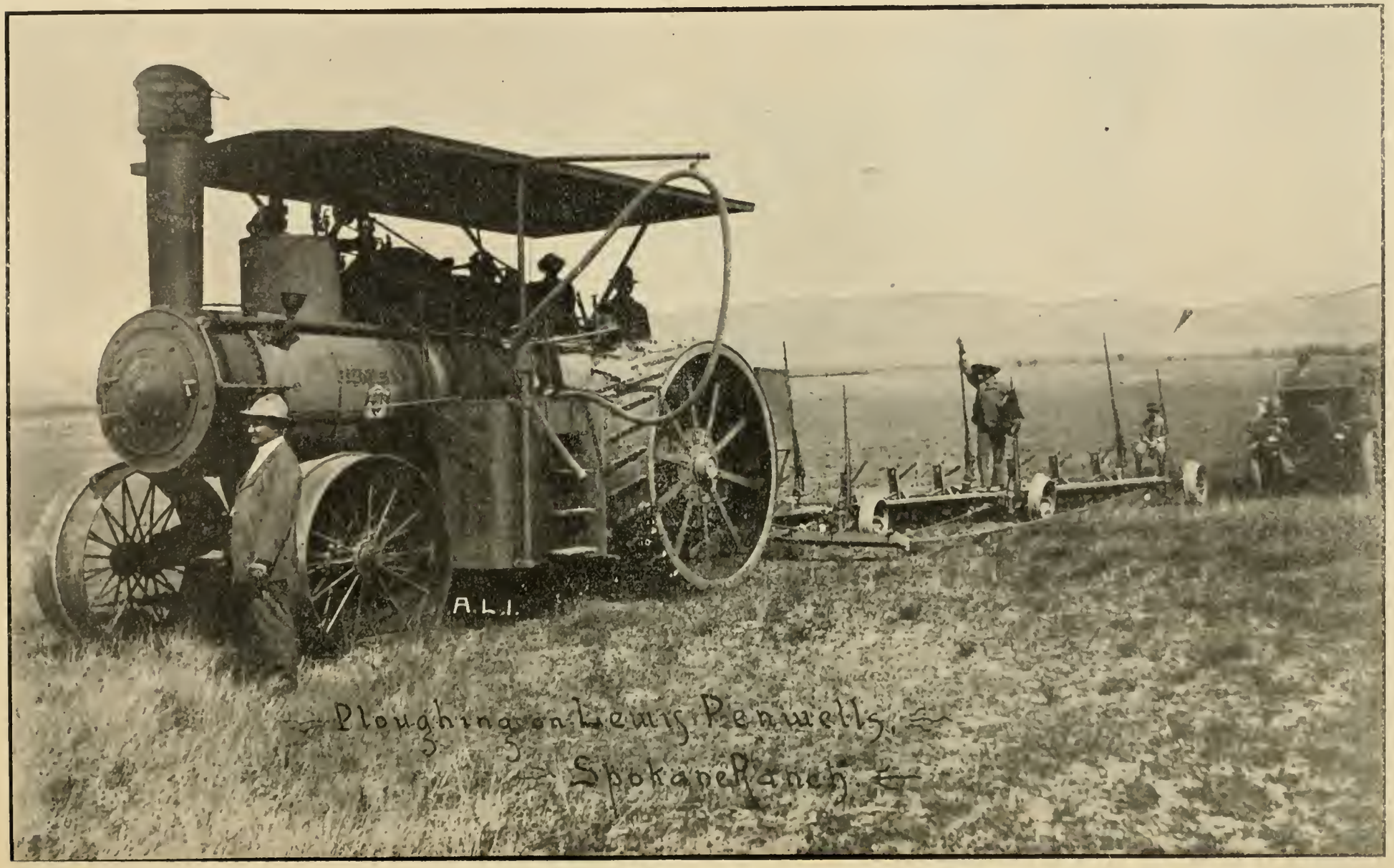
LEWIS AND CLARK COUNTY.

Lewis and Clark County is beautifully located on the Eastern slope of the main range of the Rocky Mountains in the central portion of the State and is one of the largest producers of gold and silver in the State. It has a large area of farming lands with the very best grade of soil that is fast being taken up by the most thrifty class of farmers. The northern part of the county where irrigation is impossible is taken up by cattle and sheep ranches. The climate of Lewis and Clark county is one of the most delightful in the northwest, parts of the winters being almost as agreeable as the summers on account of the warm chinook winds which come sweeping up the western coast and following the mountains right into the beautiful valleys of Lewis and Clark county. It has a population of 21,833*, an area of 3,415 square miles with an assessed valuation of $20,908, 650, there being only two other counties in the State with a greater assessed valuation.

Lewis and Clark county is remarkably well watered on account of its location on the eastern slope of the Rocky Mountains; numerous streams that are fed from the snow of these mountains cross the county nearly at right angles and flow in different courses to the Missouri River affording irrigation to the very highest points. The most notable streams in Lewis and Clark County are the Missouri River, the Little and Big Prickly Pear, Wolf Creek, Dearborn, North, South and Middle Fork of the Sun River, and the Big Blackfoot with its two branches, and others too numerous to mention. The county has 54 public schools with property valued at $527,-193 and expended $145,552 for school purposes last year.

Helena.

Midway between the eastern and western boundaries and near the southern boundary of Lewis and Clark County is situated Helena, the Capital of Montana, the financial, political, social and logical jobbing center of the State, having a population of 12,515*. The city was founded originally by gold-seekers in 1863, who mined from what is now its Main Street over the site of Last Chance Gulch $35,000,000 in gold. Helena is claimed to be the wealthiest city per capita in the country. A perusal of Bradstreet's Journal shows that from a list of forty to fifty towns in the United States, many of them having three to six times the population of Helena, none exceed it in bank clearingse. It is one of the noted residential cities of the West. Stockman and mining men whose interests lie hundreds of miles away live here that their families may have the advantages it offers and that their children may attend its educational institutions. It has 14 of the very finest graded schools and a magnificent high school that is one of the finest in the northwest. The Montana Wesleyan University is located here, the Helena Business College, Mount St. Charles College, and the Deaconess School for younger children. In addition the Catholic Church maintains two excellent graded schools, one for boys and one for girls, and a high school housed in a new $500,000.co building which is excelled by no other in the west. A Cathedral which will be the most



Ploughing.

splendid example of church architecture is also being erected. St. Vincent's Academy, constructed by the Sisters of Charity, has long been establishetd and is a noted school for girls. With all these schools and colleges under construction Helena will soon be one of the greatest educational centers in the State.

Helena is surrounded by forests, mountains and lakes, which rival in

U. S. Assay Office.

combined grandeur the most celebrated European scenery. Parked streets and concrete sidewalks enhance the city's attractiveness. All modern conveniences are found here, twenty miles of electric lines, lighting systems of both electric and gas, the purest mountain water and an adequate sewer system.

The city has eight clubs, two beautiful high schools, fourteen large public school buildings, sixteen fine hotels, five banks with deposits of over $9,000,000, an up-to-date Commercial Club, ten wholesale houses and retail stores of all kinds. A gymnasium, theatre, riding, tennis and other athletic clubs offer diversion and recreation. Two miles west of the city lies the Broadwater, one of the famous summer resorts of the Northwest. Here is found the largest enclosed natatorium in the world, natural hot

water being piped from Thermal Springs about one half mile away. In connection with this Natatorium is one of the finest hotels in the State which offers a desirable summer resort to those seeking pleasure and health.

Since January 1, 1909 the city has expended $250,000 on permanent improvements and the buildings erected in the city since that date cost $1,500,000.00.

Lewis and Clark County Court House.

The following manufactories are in active operation, two foundaries two brick plants, two breweries, one biscuit, one clay pipe, one creamery, twe fence, one harness, one mattress, one pan cake flour, also a smelter and concentrator at East Helena. With the awakening of Montana to its wonderful agricultural possibilities and the ever-increasing flow of immigration, mills and factories must rise to fill the wants of this

vast new population, and one of the inducements that Helena offers for the location of these new industries is the electric power from the plants of the United Missouri River Power Company. This company now has two immense dams and generating stations on the Missouri River, and within 15 miles of the corporate limits of the City of Helena, and in anticipation of the rapid increase in the demands for electric power, it is now building a third dam with a capacity more than equal to the combined capacities of the present dams; the total horse power of these plants being about 100,000 horse-power. The three dams develop a total head of 220 feet, and impound three storage reservoirs extending for over 60 miles along the Missouri River, and have a total area of twenty square miles. These lakes form one of the most remarkable picturesque and scenic resorts for fishing, boating, hunting and summer residences to be found anywhere in the mountainous states.

With the many railroads centering here Helena will soon be one of the greatest shipping points in the state. It is centrally located making it the natural home of the Montana wholesaler on account of lessening the distance between Helena and various other points in the state.

With the advantages of available power at Helena and its central location as regards the wheat fields of the state, Helena is bound to become a milling center of great magnitude.

The public buildings at Helena include the State Capitol, Federal building, U. S. Assay Office, U. S. Weather Bureau, Court House, County Jail, Armory, Auditorium, City Hall, Library, Masonic Temple, Odd Fellows Home, Masonic Home, Childrens' Home, Florence Crittendon Home, Fort William Henry Harrison, and Montana State Fair.

The State Fair held at Helena offers an unusual opportunity to the homeseeker. Here one can obtain a comprehensive idea of the possibilities of the entire state and secure a fund of information while enjoying the many attractions. The offices of the Secretary of the State Fair are located in Helena and in connection therewith is maintained throughout the year, an extensive permanent exhibit of grains, grasses, fruits, vegetables, etc.

East Helena.

East Helena is situated on the Northern Pacific and Great Northern Railways and has a population of 1200. It has one public school also a Catholic Academy, Catholic and M. E. South churches, two hotels and six retail stores. Last year considerable improvement was made on the streets and sidewalks. The Prickly Pear Creek runs through the center of the town and is spanned by two steel bridges. Fuel is cheap and two electric power lines pass through the town affording convenient connection for power and lights. It has electric lights and a street car service. The cars making hourly trips between East Helena and the city of Helena furnish the residents easy transportation for business purposes and give to their children an opportunity to attend the different schools and colleges in the city.

East Helena is in the midst of a large farming community and is a

supply point for a number of mining camps. Here is located a plant of the American Smelting and Refining Company, which treats custom ores exclusively, and purchases lead, silver and gold ores and a small quantity of copper ores. It has a daily capacity of 800 tons, and employs about 400 men and has a monthly payroll of from $30,000 to $40,000.

Marysville.

Marysville is on a branch line of the Northern Pacific Railway, and has a population of about 600. It has water power undeveloped and water works, one public school, one high school, three church buildings, one hotel, and eight business houses.

Marysville is situated at the foot of Belmont Mountain which extends west three miles to the main range of the Rocky Mountains and is located at the base of a mining section covering 200 square miles. Among the important gold properties are the Strawberry Mine, The Gould, Granite Butte, Poorman, Gloster, Piegan, Empire, Bell Boy, Towsley, Penobscot, Bald Butte, Drum Lummon, Bald Mountain, Dillon Group and Belmont, These mines are rich gold properties and have paid large dividends, yet in this section there are large undeveloped tracts of mineral land. The famous Drum Lummon has been in litigation for years but there is a prospect of an early settlement which will mean new life and a rapid growth for Marysville. These properties are located just outside the town and the milling plant is in town.

Augusta.

Augusta is the most important town in the northern part of the county and has a population of 250, a creamery, a public school building which cost $12,000, three churches, a bank, two hotels and three general stores. Water power is available but not any developed. Fuel is cheap with coal mines only 14 miles from town. The farms in the vicinity have the very finest agricultural lands and good water rights.

The Great Falls Land and Irrigation project is located within a short distance from Augusta. The proposed extension of the Great Northern from Great Falls to Missoula is partly built and will give to Augusta the benefit of transportation which is needed to make it a commercial center.

Rimini.

Chessman Reservoir near Rimini.

Rimini is the terminal point of a branch line of the Northern Pacific and has a population of 100, a public school, a church, a hall and two general stores. It is the supply point for one of the most extensive and productive mining districts in the state. The Valley Forge and Lee Mountain mines are near the town and there are many other famous mines in the vicinity which are well known producers.

Lincoln Connty Forest.

LINCOLN COUNTY.

In the Northwest corner of Montana is the new county of Lincoln, having an area of 3,301 square miles and assessable property worth $5,165,801. The population according to the present census is 3,638* Lincoln practically embraces that portion of the state drained by the Kootenai River. The greater part of the county is still covered with forest, the level and rolling lands when cleared of timber make rich farm and fruit properties. It contains large coal measures and many veins of mineral with a number of properties developed. The county is making a splendid success in fruit culture and with a low altitude, mild climate, fertile soil and good railroad facilities the fruit industry will make these lands of equal value to the best in the state. The county has 18 public schools with property valued at $53,117 and last year expended $31,021 for school purposes.

Libby.

Libby, the county seat, is located on the Kootenai river on the main line of the Great Northern Railway, and has a population of 1200. Its elevation is 2,055 feet and it lies at the base of the Cabinet Mountains, said by travelers to be among the most magnificent in the world, on a broad bench which has a general slope to the river and is several miles in extent.

Lincoln County Court House.

Libby has a public school building which cost $18,000, 2 hospitals, 5 churches, 2 banks, a newspaper, a Chamber of Commerce, 3 hotels, 1 wholesale house and 14 retail stores. No water power has been de-

veloped but there is 50,000 horse power available. Last year 125 new buildings were erected at a cost of $200,000 and the permanent improvements for the same time include four and a half miles of cement walks, graded streets and a water system, electric light plant partly installed. There are several saw mills in operation near Libby, it being situated in the center of one of the greatest forests in America. Placer gold was discovered in the vicinity during the sixty's and since that time Libby Creek has annually produced her quota of the yellow metal.

Libby Public School.

One quartz mine near Libby has produced over $1,000,000. The climate is never severe and there are no strong winds. The snowfali is heavy and the springs are late, insuring perfect conditions for fruits and crops without irrigation.

Mr. James J. Hill at a banquet in St. Paul said that the land values in the Kootenai valley would soon approach those in the famous Wenatchee valley where they have reached as high as $2,500 per acre.

Libby has cheap fuel, available water power, fine clay, timber for pulp, excelsior and lumber, and offers a fine opening for good investments.

Eureka.

Eureka the chief trading point in the Tobacco Plains valley has a population of 800 and is situated on the Great Northern Railway In the recent election Eureka was made the county seat of Lincoln county, though the change has not yet been made. It has a public school also a high school, 4 churches, a bank, a newspaper, a hotel, a creamery, 7 retail stores and a number of saw mills. The electric light plant is not owned by the city and the water works system has just been installed. The fuel is the cheapest and best in the land. No water power has been developed but 20,000 horse power is available. It has an elevator with a capacity of 75,000 bushels. The chief industries are lumbering, farming and fruit culture. The town is surrounded by immense forests of very fine timber and has extensive marl beds and lime deposits in the vicinity. There are openings for a flour mill, cement and brick factories. Eureka has a live Commercial Club and a bright future.

Troy.

Troy is situated in the western part of the county on the Kootenai river on the Great Northern Railroad, and has a population of 500, a public school, 3 hotels, 2 general stores and a number of saw mills in the vicinity. Troy is the supply point for a number of mining camps and is in the midst of a great farming and fruit section. It has a Commercial Club and a number of openings for new enterprises.

MADISON COUNTY.

The area of Madison county is 4,480 sq. miles, and the total assessment for 1910 amounted to $6,965,359.00. The population of the county, is 7,229*. Virginia City the county seat was formally the capitol of the territory of Montana. It is located in Alder gulch where the gold was discovered in 1863 and is estimated to have yielded between $150,000,000 and $200,000,000,000 in gold. Madison county is still an important gold producer. Dredging operations are carried on extensively and a large number of quartz mines which have produced their share of Montana's gold output, many of which are still in operation. The county has many valuable deposits of building stone, lime stone, fire clay,

Driveway to an Orchard Home

potters clay, coal, iron, manganese, lead and zinc and precious stones, including sapphires, garnets and moss agates.

Other resources include stockraising, agriculture and horticulture. The growth of the county has been retarded by lack of railroad facilities and when the promised lines of railway furnish adequate transportation to her fertile valleys and rich mining camps, Madison county will come to the front as one of the wealthiest of the great counties of Montana.

Madison County has 59 public school buildings with school property valued at $104,086 and last year $43,536.30 was expended by the county for school purposes.

Virginia City.

Virginia City is the county seat and has a population of about 600. The transportation is furnished with automobiles and stages from the railroad station at Alder eleven miles distant. It has one public school also a high school, two churches, two newspapers, one hospital, two banks,

Showing Dredge No. 2 in Operation at Ruby.

two hotels and fifteen retail stores. The county buildings cost $35,000.00, the city buildings $12,000.00 and the church buildings $30,000.00.

Last year the city expended $25,000.00 on permanent improvements and five new buildings were erected at a cost of $20,000.00. Virginia City has an electric system and an excellent water system. In the matter of has an electric light system and an excellent water system. In the matter of

Virginia City is noted for being an early territorial capitol and the first place in Montana where law and order gained the ascendency over the out-laws of early days. It is one of the important commercial and mining centers in the state. It is estimated that more gold has been taken out of Alder gulch since its discovery in 1863 than has been produced by any other ground of similar area in the world.

Twin Bridges.

Twin Bridges is situated on the N. P. Railway, and has a population of about 600. The Jefferson river flows through the town and furnishes splendid water power with 5,000 H. P. available but none developed.

Last year $3,000.00 was spent on new buildings. It has one public school, one high school, two churche buildings, one newspaper, one bank, one club, two hotels, and nine retail stores.

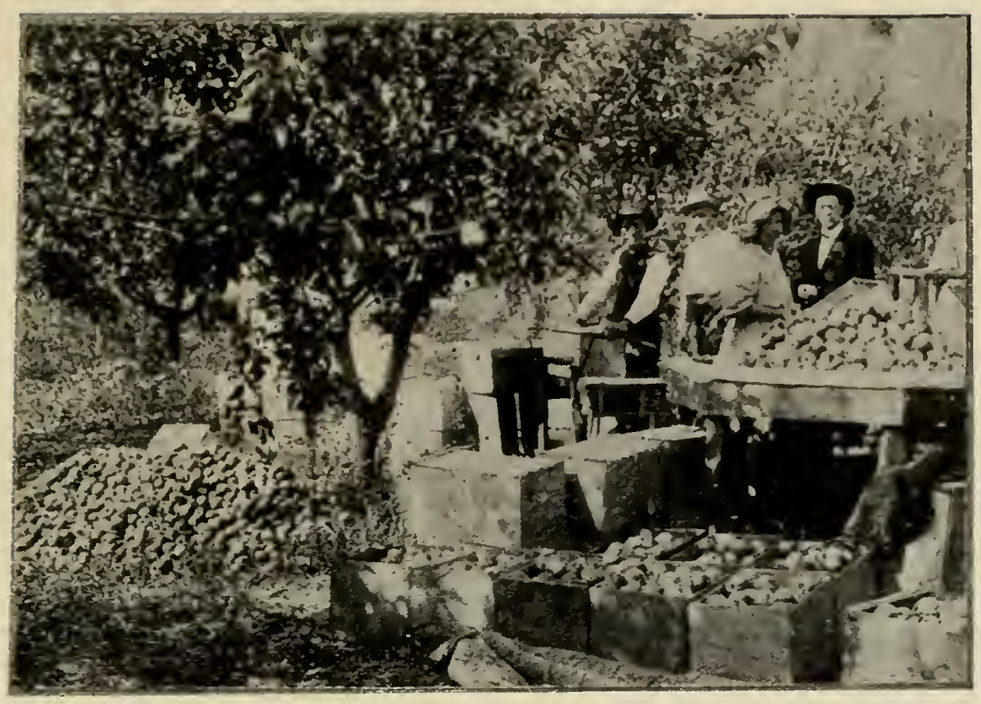
Twin Bridges is the home of the Madison County Fair and the seat of the State Orphans' Home. The principal industries are farming, fruit raising, livestock and gold mining. Two important irrigation projects have recently been started which will open for settlement large areas of bench land in the vicinity of Twin Bridges and will add materially to its prosperity. There is an opening at present for a creamery and a flour mill.

Sheridan.

Sheridan is on the Northern Pacific Railway, and has a population of about 800. There are three mountain streams in the vicinity and much water power is available. Last year $3,000.00 was expended by the city and $10,000.00 by individuals for the construction of new buildings. It has one flour mill, one creamery, one school, one hospital, one bank, one hotel, seven stores and three churches (Catholic, Episcopal and Methodist). Sheridan was named for the famous general just after the battle of Winchester. It is centrally located in the heart of the Ruby Valley, a rich agricultural district and well protected by mountain ranges. The climate is generally mild and pleasant for a northern latitude.

It has a public library of 1500 volumes. Sheridan has a public park of 40 acres. A gravity system supplies the town with mountain water and a contract has been let for an electric light system.

Many mining properties in the vicinity have been producers for years. Hay, grain and potatoes are the principal crops. Large profits are made on apples, small fruits and garden truck. The hog industry is extensive and Sheridan is the principal shipping point in the county for high grade cattle and horses.



Preparing Fruit for Shipment.

Pony.

Pony is the terminal point on a branch line of the N. P. Railway, and has about 500 population. Last year $20,000.00 was spent on buildings and improvements. Pony has electric lights and water power with 500 H. P. available and 100 H. P. developed. A creamery has been in operation six months in which time the output was 15,000 lbs.

Pony has one flour mill, 4 quartz mills, one public school building, one newspaper, three churches, one bank, one hotel and seven retail stores. The school building cost $10,000.00.

The principal industry is mining and Pony has a number of properties which are good producers.

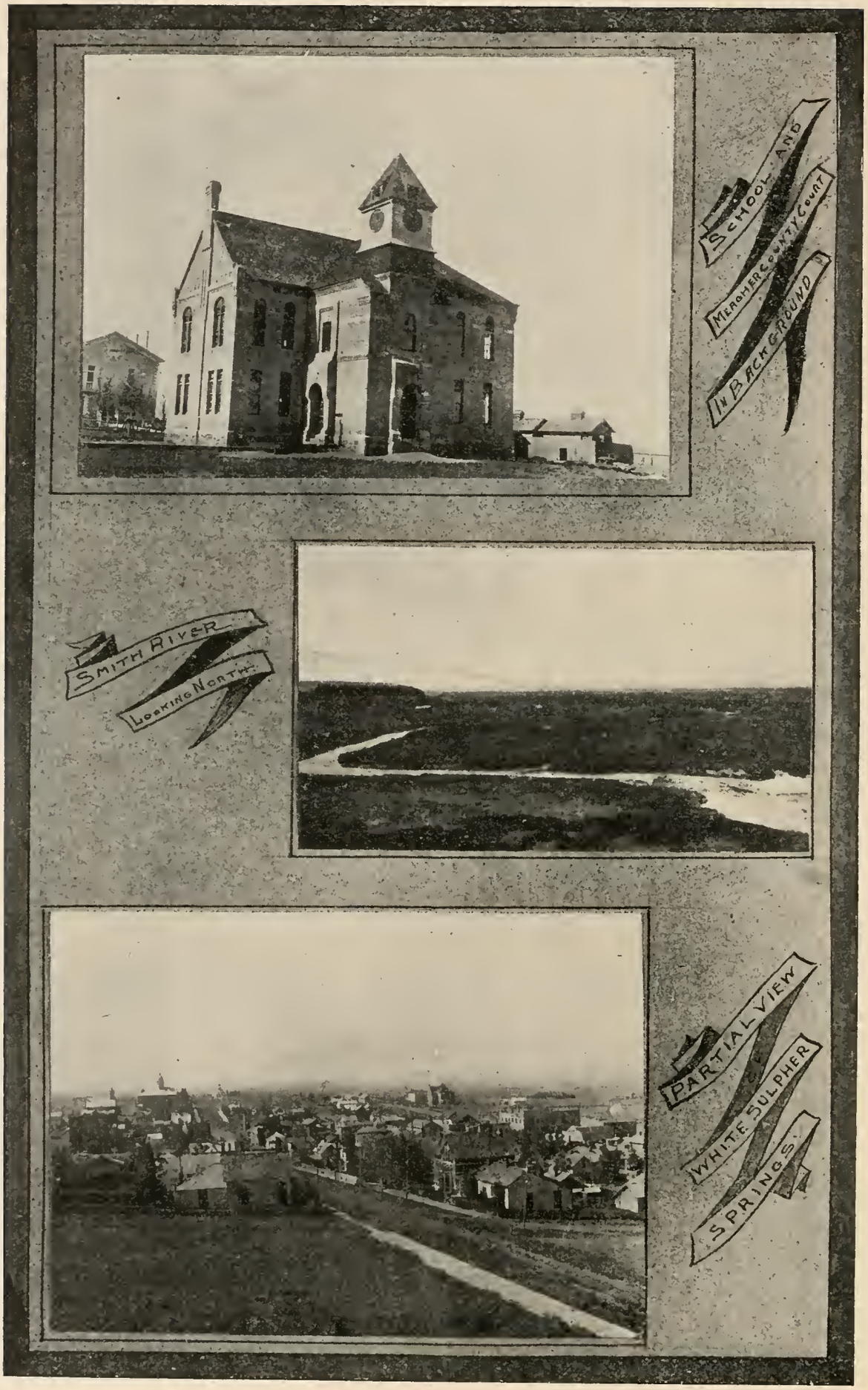
MEAGHER COUNTY.

This county was named in honor of Gen. Thomas F. Meagher, whose statue adorns the grounds of the State Capitol Building. It has an area of 2,508 sq. miles and a total assessed valuation of $7,108,566.00. The population according to the present census is 4,190*. The county contains one of the most productive regions in the state with hay as the principal crop, but grains and vegetables of all kinds make large yields.

The principal industries are stock raising and wool. The new railroad will furnish better transportation facilities and Meagher bids fair to rival the other counties in agriculture and mineral production. Meagher has 27 public schools with school property valued at $59,175.00 and last year the sum of $40,235.00 was expended by the county for school purposes.

White Sulphur Springs.

White Sulphur Springs, the county seat is in the heart of the Smith River Valley and is the terminal point of the White Sulphur Springs and



Group of Public Buildings

Yellowstone Park Railway, just completed.It has a population of 500. It has public schools also a high school, three churches, two banks, one newspaper, a commercial club, three hotels and nine retail stores.

The town has a water works system, electric lights and abundant water power with 50 H. P. developed. The county buildings are located here and there is a good town hall and a large Auditorium.

The survey has been made for the proposed Glendive-Helena cut-off of the Northern Pacific, which will be built through White Sulphur Springs and will cause the rapid development of this section of the country.

A magnificent hotel is being constructed at the Hot Springs, which is one of the best health resorts in the world and as soon as it has sufficient accommodations, thousands of guests are assured.

Judith Gap.

Judith Gap is located at the beginning of the famous Judith Basin and has two railway lines, the Great Northern and the C. M. & P. S. The town is just two years old and has a population of 350. It has a $10,000.00 school building, a newspaper, two churches, a bank, two hotels and three

Railway Station at Harlowton.

general stores. Last year a total of $100,000.00 was expended in the erection of new buildings, including 35 business buildings.

The country surrounding for 25 miles has been taken by homesteaders and development in agriculture is well under way. The town is the division point on the Great Northern Railway, with shops equipped with the most improved machinery.

Hedgesville.

Hedgesville is a new town on the Great Northern Railway and has a population of 300. It has an elevator with a capacity of 20,000 bushels, a public school, a church, a bank, a hotel and five general stores. Fuel is cheap, there are large coal deposits in the vicinity and the town is a central point for a large farming section.

Martinsdale.

Martinsdale is on the C. M. & P. S. Railway and has a population of one hundred and fifty, a school, a newspaper, a church, a bank, 2 hotels and 2 general stores. Fuel is cheap, there is a coal mine in the vicinity and available water power. Last year five new buildings were erected at a

total cost of $10,500. The country surrounding the town is especially adapted to wheat raising.

Harlowton.

Harlowton is on the Chicago, Milwaukee and Puget Sound Railway, and has a population of about 900, electric lights, a water system, three banks, an opera house, 3 churches, a newspaper, a public school, a brick plant, a flour mill and a number of business houses and is the metropolis of one of the richest farming sections in the State.

MISSOULA COUNTY.

Missoula County has a population of 23,596*, an area of 4,182 sq. miles and an assessed valuation of $16,799,987.00, being the wealthiest county in the western part of the state. It has a county high school and 50 public schools with property valued at $209,263.00 and last year the county paid $140,491.68 for school purposes.

The county is watered by the Missoula, Rattle Snake, Black Foot and Bitter Root rivers. These unite to form the Clarks Fork, whose tributaries drain nearly all the western portion of the state.

Missoula County is rich in minerals but is still richer in her agricultural and horticultural resources. The mild climate and fertile soil make Missoula wonderfully productive in fruits, grains and vegetables. The lumber business is one of the important resources of the county.

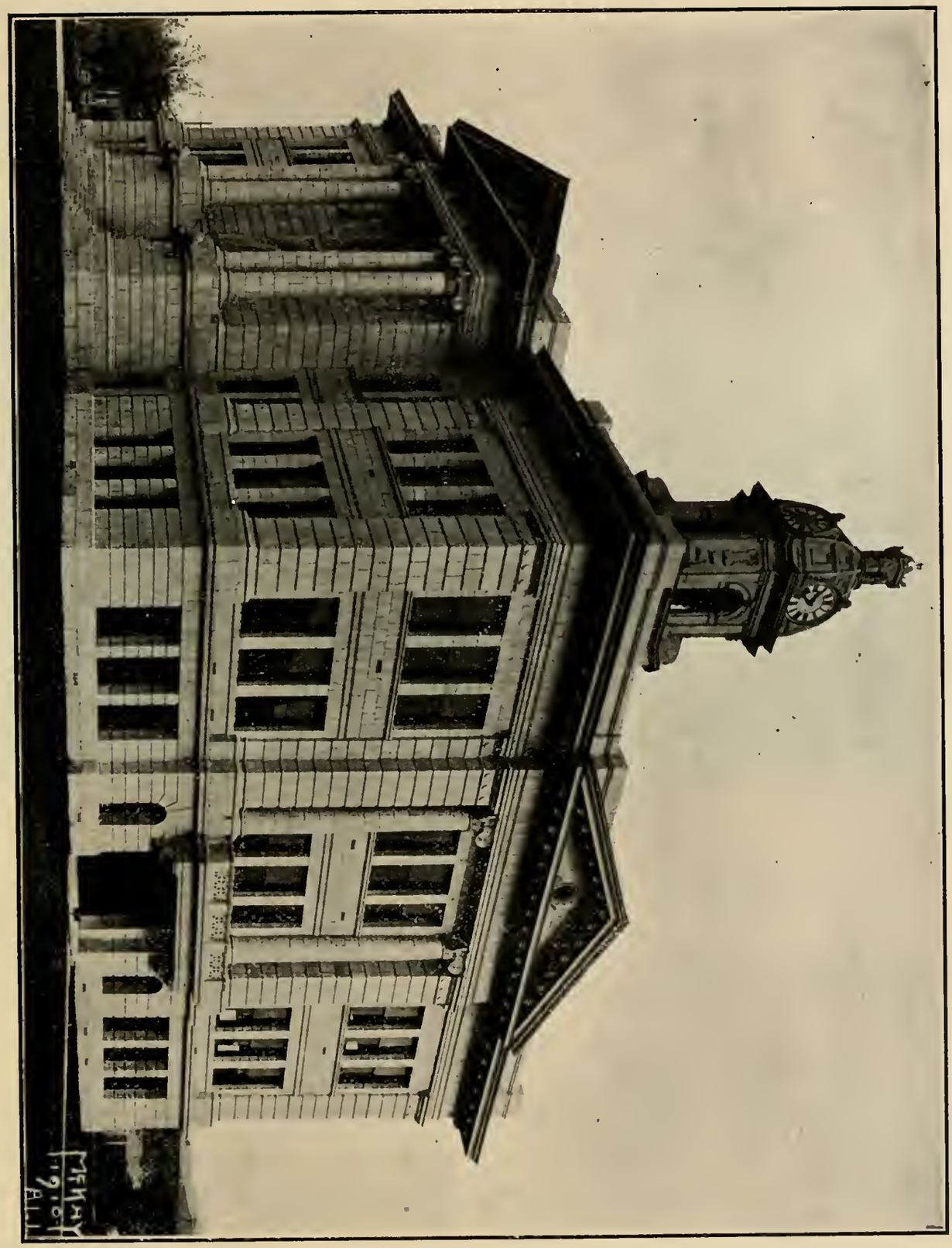
Missoula.

Missoula the "Garden City" of Montana, is the county seat with a population of 12,869*, and is an energetic, wide awake and busy municipality, an admirable place to live, delightfully situated at the foot of the western slope of the Main Range of the Rocky Mountains and is fortunate in the make-up of its population, which is practically American. It has all the superior advantages of the larger eastern towns and its citizens are intelligent and enterprising.

It has two high schools (city and county), nine graded schools, a catholic academy with 500 students, also a first class business college. The University of Montana is located at Missoula and is a thorough, aggressive and well equipped institution. In the University buildings are to be found the most modern laboratories, the finest class-rooms, a complete library and efficient teachers.

It has fourteen factories; one brewery, one box, five cigar, one trunk, two soda pops, two sash and door, one culvert pipe and one flour mill; sixteen wholesale houses, one elevator, with a capacity of 28.000 bushels. The flour mill has an output of 100 barrels per day. It has 150 retail stores, four banks with deposits of over $4,000,000.00.

The city has nine hotels, sixteen churches, three hospitals, city water works and electric light plant, sewer system and extensive water power with only 5,000 H. P. developed. Particularly favored is Missoula in the way of newspapers, one morning and one evening paper giving the latest Associated Press and local news.



Missoula County Court House.

The main activities of the city and neighboring territory are the carrying on of horticultural and agricultural pursuits, mining and lumber industries and as a railroad center. Missoula is the distributing point for a territory extending 75 miles in all directions, and the gate-way of four famous valleys: The Flathead Indian Reservation, noted particularly for its fine hay, grain and stock; the Bitter Root Valley, a rich farming, also a fruit and berry district; the Coeur d'Alene mining district and the Missoula Valley of agricultural fame. The products of all these valleys contribute to the wealth of Missoula, the out-skirts of the city are being built up wonderfully in small fruit and vegetable tracts.

A Scene in the Bitter Root Mountains.

The "Garden City" has been exceedingly active in the erection of large civic and commercial buildings. Recently there has been completed a five story up-to-date hotel, a six story office building, a Masonic Building, a Court House, which cost $175,000.00, the new Milwaukee Depot, 25 business buildings and a large number of cottages at a total cost of $1,750,000.00, also 20 miles of street railway with pay-as-you-enter cars, and a lumber concern has just broken ground for an $80,000.00 band saw-mill.

Missoula is the division point on the main line of the Northern Pacific, which has extensive shops at this point and it is also on the main line of the C. M. & P. S. Railway, and a terminal point of the Bitter Root Valley and Coeur d'Alene branch lines and a line is being surveyed which will connect Missoula with Great Falls.

As to the climate; on all sides mountain ranges keep away the cold of winter, and from snow-capped peaks come cool breezes which mitigate the heat of summer, and the summer evenings are long and

delightfully cool. January's temperature averages 20.3 while July and August average 66.

The average precipitation is 15¾ inches per annum. Missoula for several years has been garrisoned by companies from the 25th U. S. Infantry. The fort is beautifully located on the Bitter Root river four miles from the City.

Missoula has a Chamber of Commerce, a paid fire department and a good police system.

The population of Missoula is five times greater than it was ten years ago and the future possibilities in growth and business opportunities are more propitious than they have been in preceeding years.

Big Blackfoot Lumber Company's Mill, at St. Regis.

Saltese.

Saltese is on the Northern Pacific and C. M. & P. S. Railway and it has a population of about 500. It has water works, electric lights, a school, an opera house, four hotels and two general stores and last year $20,000.00 was spent on improvements. It has water power with 40 H. P. developed and 5,000 available.

Saltese is the principal shipping point for the great mines in the east Coeur d'Alene district. There are several saw-mills in and near Saltese and large tracts of timber available. It is the division quarters for the mountain railroad engines and has a four-stall round-house, a coal elevator and a turn-table.

Bonner.

Bonner is on the Northern Pacific and C. M. & P. S. Railway, and has a population of about 500.It has water works, a school house which cost $10,000.00, two churches, one hotel, three general stores and two large saw-mills. Last year $20,000.00 was spent on the construction of new

buildings. Bonner has an abundant water power available with 5,000 H. P. developed.

Jocko.

Jocko, the agency headquarters for the Flatheads, is in a commanding position in the Jocko Valley. It has a population of 250 nearly all Indians. It has one church and a government school for Indians.

This valley can be made one of the most productive in western Montana and it is especially adapted to fruit raising. The main line of the Northern Pacific traverses the entire length of the valley, at one point being only one mile from Jocko and having a station four miles distant.

The mountains surrounding this valley are covered with fine timber in which no cuttings have ever been made. The U. S. Reclamation Service has just completed an irrigation project which will water the greater part of the valley. The streams near Jocko can be made to develop considerable power.

Lolo.

Lolo is on the Northern Pacific Railway, and has a population of about 200. It has three general stores, one saw-mill, a church and a school. The principal industries are farming and fruit growing. The farmers in the vicinity are prosperous and are accustomed to taking prizes for their stock and products.

PARK COUNTY.

Park County has an area of 2,651 sq. miles and a population of 10,931*. The total assessment of the property in the county is $8,861,320.

In the line of natural resources it is one of the most prolific counties in the state. A few years ago mining and stock raising were the leading

Public School in Livingston.

industries but now agriculture has the lead and the diversified farm is a big factor in its general prosperity. Park has long supplied large quantities of coal to the markets of the state and the present development is sufficient to show that her coal deposits are practically inexhaustible.

Nature has been lavish in her gifts and Park County has more than the usual number of country towns, drawing support from her great resources. There are 53 schools in the county with property valued at $142,831.00. Last year the county spent $53,745.00 for school purposes.

Livingston.

Livingston, the county seat is on the Northern Pacific Railway, and has a population of 5,359*. It is an ideal city of homes with fine buildings and handsome lawns on every street. The city schools are well equipped and first class in every particular. The three buildings cost $150,000.00. The City Hall cost $10,000.00, the County Court House cost $35,000.00 and the Jail $25,000.00. The County buildings occupy an entire block surrounded by cement walks and well-kept lawns. The public library cost $15,000.00, the Baptist, Catholic, Congregational, Episcopal and Methodist churches have buildings of which the city is justly proud. There are five hotels, equipped with all modern conveniences. The streets are continuous from one end of the city to the other. The sidewalks in the business part of the city are 14 feet wide and made of concrete; in the residence portions they are six feet wide with parking between the walk and the curbing. There are 35 miles of concrete side walk in the city.

Callender Avenue Livingston.

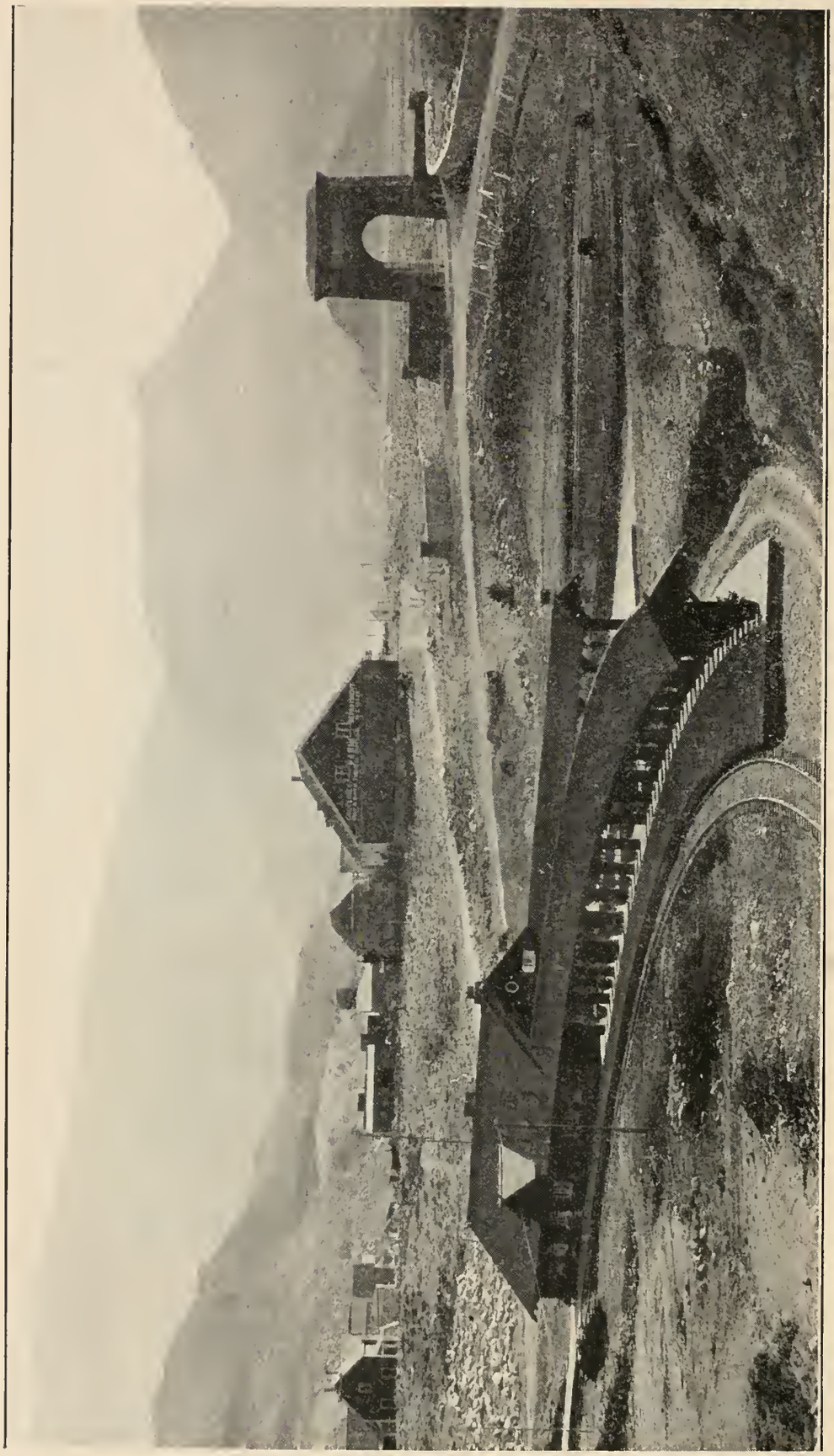
The sewer system is modern and complete, the water supply is taken from the Yellowstone River to a reservoir about 500 feet above the city affording a gravity pressure that is constant and uniform.

The streets and houses are well lighted by electricity from a power plant that has been recently increased to 2,000 H. P. The business men are aggressive and broad gauge and all lines of merchandise are represented

Livingston has two hospitals, three banks, one daily and two weekly newspapers, one packing and cold storage plant, thirty-two retail stores, two elevators and one steel bridge and iron factory.

Two important branch lines of the Northern Pacific radiate from this point. One runs to the Yellowstone National Park, and another to Clyde Park, giving transportation to rich farming sections in the Shields River Valley.

Livingston boasts of the largest machine shops on the Northern Pacific system between Brainard, Minn., and the Pacific coast. Practically all of the repairs of rolling stock including the heavy engines are made in Livingston shops. The finest railroad passenger station between St. Paul and the coast is at Livingston. This magnificent building was erected at a



Gateway to the Yellowstone National Park at Gardiner.

cost of $150,000.00. Livingston is the gateway to the National Park and last year according to the Secretary of the Interior, 19,575 tourists passed through Livingston on their way to the great pleasure grounds.

The water power in the vicinity has been harnessed to some extent, but there are a large number of natural sites where power can be developed. The water power developed in Park County at present is 5000 H. P. but this can be largely increased.

The best of wheat is raised in Park County and a flour mill would be profitable. The supply of material for portland cement is practically inexhaustible.

Gardiner.

Gardiner is located at the boundary line of the Yellowstone National Park on the Northern Pacific Railway. It has a population of 380. Eighty H. P. has been developed with a large amount of water power available. Fuel is cheap and there are coal properties in the vicinity. A number of new buildings were erected last year at an estimated cost of $22,000.00. Gardiner has electric lights and a water system which is under private control. It has two elevators, one public school, one church, one bank, four hotels and four general stores.

A large business is derived from the tourists and the transportation companies which operate in the Park.

Clyde Park.

Clyde Park is located on the Northern Pacific in the center of the Shields River Valley and has a population of 500. Twenty-five new buildings were erected last year at a total cost of $60,000.00.

It has one elevator with a capacity of 30,000 bus., one creamery with an output last year of 55,000 lbs. There are two churches, one bank, two hotels, and five general stores.

The principal industry is farming and since the completion of the railway one year ago, Clyde Park has become an important business point.

POWELL COUNTY.

The county has an area of 2,514 square miles and an assessed valuation of $5,671,990. The present population is 5,904*.

Nature has been lavish in her gifts to this section of the state. The county has great mineral wealth, the soil of the valleys is of remarkable fertility, the foothills are covered with nutritious grasses and the mountains with forest timber. The best markets in the State are not far distant. The State Prison is located in this county at Deer Lodge. The county has a high school at Deer Lodge. There are 28 public schools in the county having property valued at $81,499 and last year the sum of $25,325 was expended by the county for school purposes.

Deer Lodge.

Deer Lodge is the County Seat and has a population of 2500, and is located on the Northern Pacific and the C. M. & P. S. Railroads. The county buildings and the Montana State Penitentiary are located here. It has a water system and electric lights, a library, a public school, also

the county high school, the College of Montana and St. Mary's Academy, a hospital, 6 churches, 1 bank, 2 newspapers, 4 hotels and a large number of business houses.

It is a division point on the C. M. & P. S. Railway which employs 300 men in the car shops. About 200 new buildings were erected last year and the city spent $300,000 on improvements including the new sewer system and several miles of new sidewalks.

Deer Lodge is essentially a city of homes and offers unequalled advantages as a place of residence.

Located in a wide and fertile valley between mountain ranges, the scenery is magnificent and the air bracing and invigorating. The resident streets are wide and lined with beautiful shade trees.

Powell County County Court House

The country surrounding is a paradise for hunters and fishermen, game of all kinds being plentiful and many streams well stocked with trout of easy access. The mountains nearby provide numberless spots ideal for camping purposes. Deer Lodge Valley is watered by many beautiful streams. Those to the west of the river form a chain of lakes which may in time be used as reservoirs to conserve the water for the purpose of irrigating the many thousands of acres of productive table lands on the western foothills. There are excellent opportunities in the dairy business and need for a creamery.

Elliston.

Elliston is on the Northern Pacific Railway and has a population of 200, a public school, a hotel, 2 general stores, a church and a number of

High School at Deer Lodge.

houses representing different lines of trade. It is the principal town in the Little Blackfoot valley and there are a number of good mining properties in the vicinity.

Helmville.

Helmville is the principal town in the northern part of Powell county and has a population of 100, 2 churches, a public school including the ninth grade, Catholic and Methodist churches, a bank, 2 hotels a drug store and 2 general merchandise houses. Immense water power can be developed in the vicinity. The tributary territory contains 100,000 acres of rich agricultural land which should be developed for grain and dairy farms.

Garrison.

Garrison at the junction of the two lines of the Northern Pacific Railway and also on the C. M. & P. S. Railroad has a population of 250, 2 general stores and a hotel and is quite at railroad point and has a good payroll.

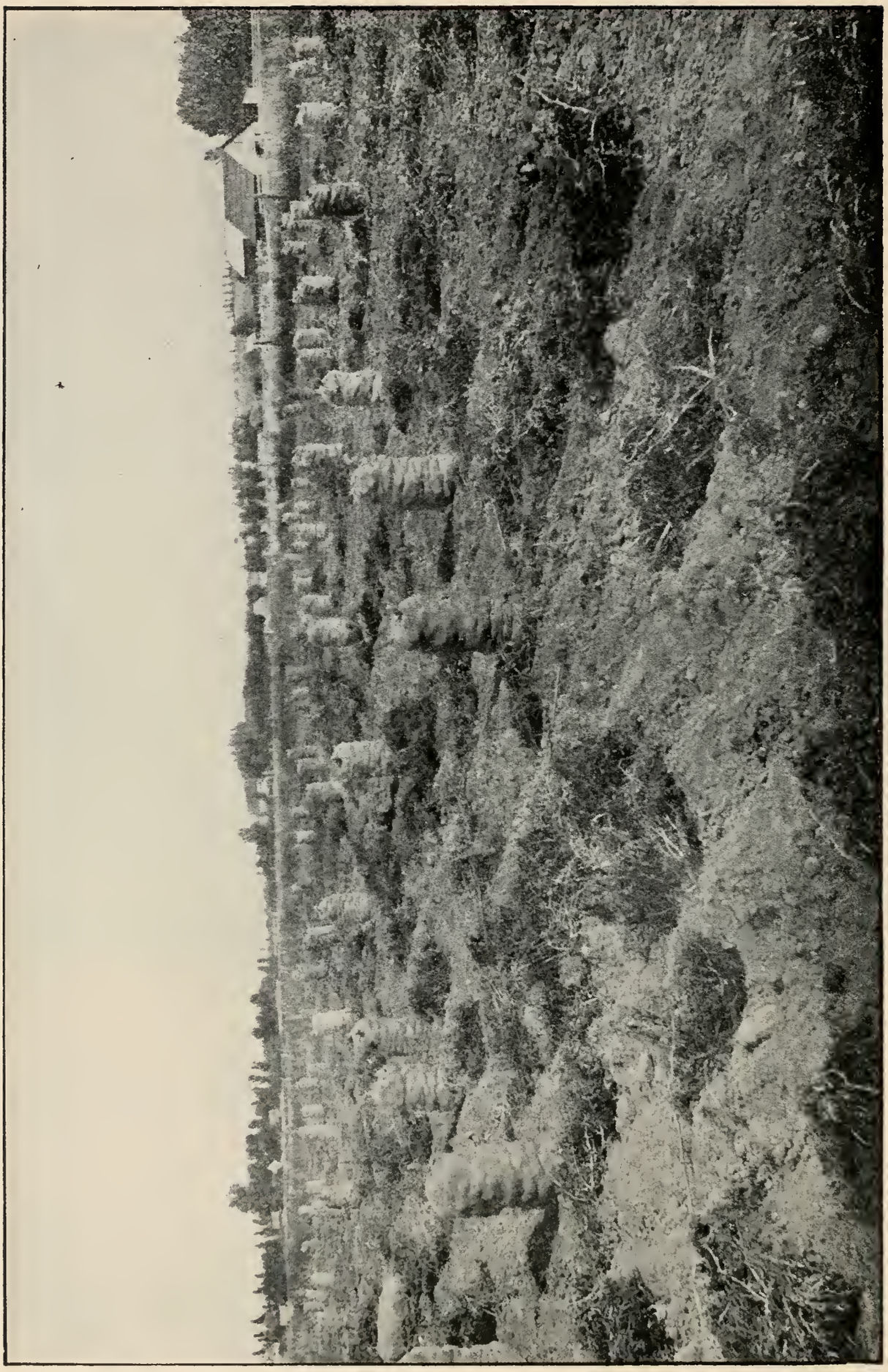
RAVALLI COUNTY.

Ravalli County has an area of 2,396 sq. miles and its assessed valuation amounts to $5,532,111.00. It has 35 public schools with property worth $131,458.00, and last year the county spent $76,441.56 for schol purposes.

It embraces nearly all of the wonderful Bitter Root Valley already noted for its bounteous yield of grains and fruits. It is a country destined to be a paradise of proseprous homes with lands capable of as much production and wealth as any like area in the United States.

It contains 400,000 acres of arable land the most of which is under irrigation ditches and canals. A branch of the Northern Pacific runs through the farming section of this magnificent valley.

The towns are growing rapidly and there has been more building of



Potatoes, 700 Bushels to the Acre.

homes and business houses in the county during the past year than for the previous ten years put together. The population of the county is 11,666*.

Hamilton.

Hamilton the county seat, is a modern town with about 3,500 people and a large additional tributary population. It has three banks, three hotels, a number of lodging houses, two wholesale houses, sixty retail stores, two newspapers, one magazine, seven churches, two public school buildings, also a city high school.

The City Hall cost $12,000.00, the Court House $40,000.00, the schools $50,000.00. It has three saw-mills, one flour and oatmeal mill, one canning, one cigar and one brick factory. It has city water works, electric lights

and a sewer system. The elevator has a capacity of 8000 bus., and the flour mill has an output of 300 bbls. per day. The output of the creamery last year was 44,020 lbs. of butter worth $13,206.00. Water power is abundant with at least 5,000 H. P. available and 100 H. P. developed.

In addition to being the chief city of the famous Bitter Root, Hamilton is fast becoming known for its manufactured products. The great lumber mills are complete, furnishing building supplies, boxes and other lumber products to all Montana. The flour, oatmeal and rolled oats are manufactured from gold medal grains and command a growing market. Bitter Root canned fruit and other products now being sold extensively are naturally of great excellence.

A sugar beet refinery and other manufactories are expected. Hamilton is on a branch of the Northern Pacific. An electric traction line already in operation in the northern part of the Valley is now headed toward Hamilton.

On the sunny side of the Great Divide, this coming metropolis is geographically related to the Pacific coast and is already a factor in the enormous passenger and freight traffic of the north-west.

That Hamilton is destined to become a large city is no longer a question to men who study immigration and city building. It is the hub of a

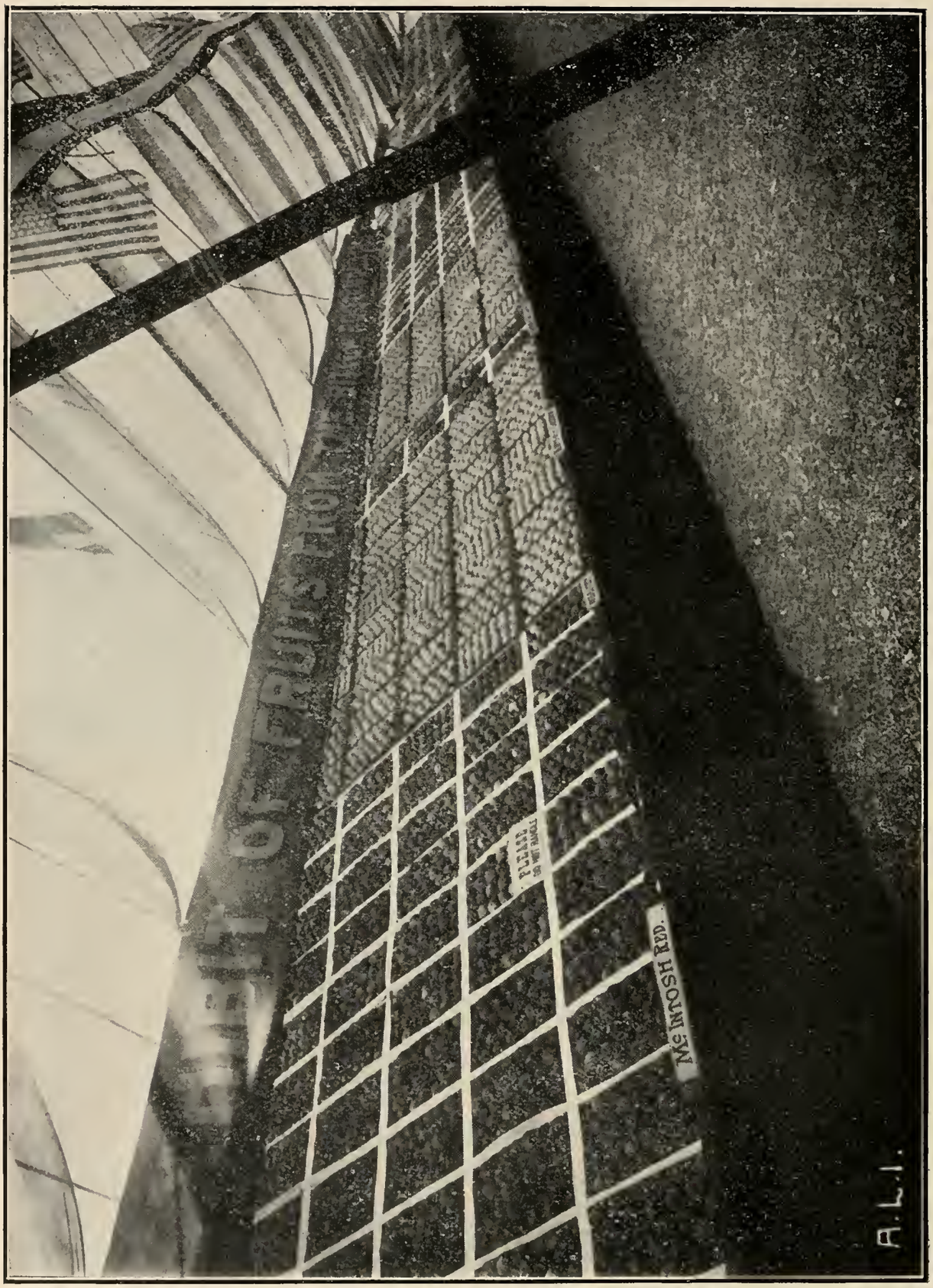


Exhibit of Ravalli County Fruit.

vast rural empire and will naturally have the reflection of the country side upon the commercial enlargement of the city. Industries adapted to the district with their resultant effects will add new vigor and new enterprises.

With all these dynamic forces back of this strong young city forever pushing and constructing, there is no other possible future than that of a great country capital supplying the demands of a well populated and wealthy community.

Stevensville.

Stevensville is the second town of importance in Ravalli County with a population of about 1500. It has a public school, a high school, one hospital, six churches, two banks, two clubs, a library, one hotel, eighteen retail stores and one creamery with an output of 300,000 lbs. of butter worth $100,000.00.

It has city water works and electric lights. Last year Stevensville expended $30,000.00 on permanent improvements and during the same time, 80 new buildings were constructed at a total cost of $175,000.00. Fuel is cheap and Stevensville can take care of an evaporator, a cannery, and a packing house. The country adjacent is one of the best farming and fruit growing sections in the state. The town is rich in historic events. The first church in Montana was established there in 1841 by Father De Smet. The first wheat, potatoes and fruit in the state were grown there and in 1864, Father Ravalli in whose honor the county was named, built the first flour and saw-mill, within the boundaries of Montana.

Victor.

Victor stands under the shadow of historic St. Mary's Peak where the Northern Pacific crosses the Sweathouse and has a population of about 400. It is one of the most beautiful locations in the world. It has electric lights, a grammar and high school combined which cost $18,000.00, three churches, one bank, two hotels and five general stores. One hundred H. P. has been developed with water power sufficient at least 3000 H. P. Last yar 20 new buildings were constructed at a cost of $30,000.00. Directly tributary are some of the choicest fruit and farming lands in the valley and a few miles west are the Curlew and Pleasant View Mines.

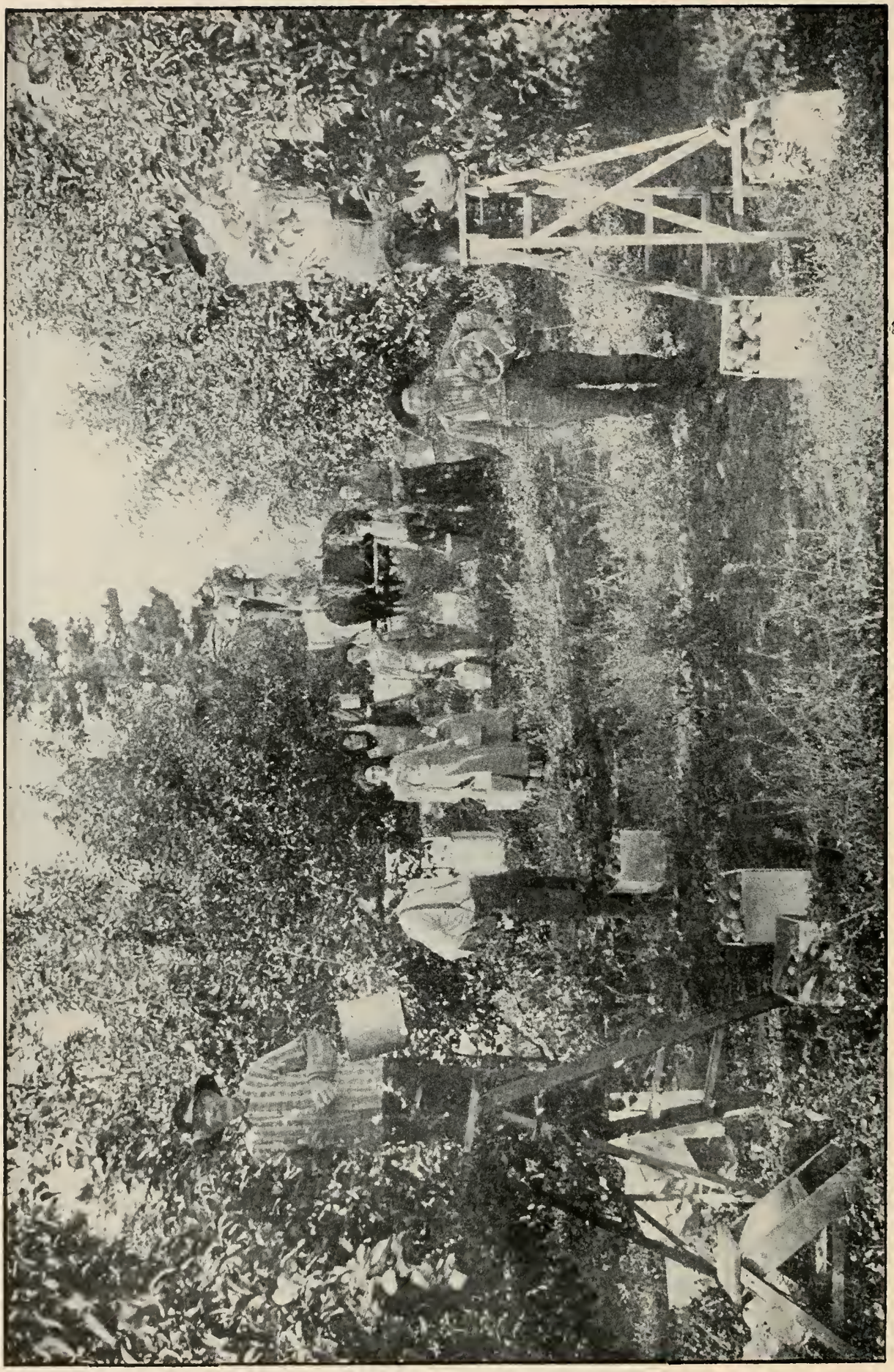
Corvallis.

Corvallis is located in the heart of the valley with a population of about 250 and is about two miles from Woodside station on the Northern Pacific. It has one public school, three churches, one bank, one hotel and nine business houses. Last year several residences were built at a cost of more than $12,000.00 Corvallis is in the midst of a land of gardens, orchards, and farms and the adjacent country is so densly settled that it is difficult to mark the town limits.

Darby.

Darby is a thriving little town on the Northern Pacific with a population of about 300. It has one public school, two churches, one bank, three clubs, one town hall, two hotels and five retail stores.

Last year 15 new buildings were erected at a cost of $30,000.00.



We:ghted with Apples.

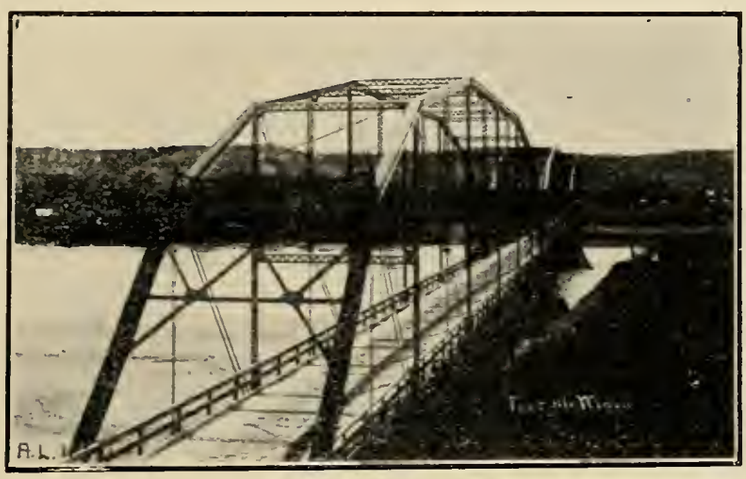
Darby is situated near the Bitter Root river. Water power can be developed and fuel is cheap with coal deposits only three miles away.

Near Darby on the lower benches is the finest fruit land in the valley. Four orchards ship annually 50,000 boxes of apples.

ROSEBUD COUNTY.

Rosebud County contains 9,510 sq. miles and has property valued for taxation at $9,987.091.00. The population of the county is 7,985*. The climate is congenial and the soil in the valleys and on the benches is abundantly prolific. The county is still an important section for stock raising and wool, but these industries are gradually yielding to the advances of agriculture. Hay, grain, corn, potatoes, sugarbeets and all kinds of vegetables are grown with wonderful success.

Rosebud has abundant resources of many kinds and will continue to increase in wealth and population. The county has 33 public schools with school property valued at $70,547.00 and last year the sum of $43,126.00 was expended by the county for school purposes. A part of the Crow Indian Reservation is included in the area given for the county.



Bridge Across the Yellowstone River, at Forsyth.

Forsyth.

Forsyth the county seat is on the Northern Pacific and the C. M. & P. S. Railways, and has a population of 1800. It has city water works and an electric light plant, a sewerage system and a fire department. The county buildings are located at Forsyth.

Last year the city expended $25,000.00 on cement walks and $35,000.00 on its water and sewer systems. Thirty new buildings were erected at a total cost of $90,000.00. It has one elevator, two public school buildings also a high school building, a newspaper, Methodist and Presbyterian churches, three banks, one club, four hotels, one wholesale house and ten retail stores. The principal industries are agriculture, livestock and wool. Forsyth can take care of an oatmeal mill and a cement block factory.

There are 4,000,000 acres of arable lands, tributary to Forsyth, consisting of homesteads, state and railroad lands, nearly 2,000,000 being homestead lands. Fuel is cheap, lignite coal being found in nearly every sec-

tion of the county. The water power available in the vicinity is estimated to be 1000 H. P.

Hysham is a typical western town on the Northern Pacific Railway, between the Pease Bottom, one of the most productive sections in the state, and Sarpy Creek which drains an extensive area, especially adapted to stock raising. Hysham has one bank, one church, and three retail stores. Last year the town expended $30,000.00 on permanent improvements and 11 new buildings were erected at a total cost of $20,000.00.

There are favorable openings for farmers who are looking for properties at reasonable prices. Large crops of hay, grain, potatoes and sugar beets are produced in the vicinity.

Rosebud.

Rosebud is favorably situated on the Northern Pacific Railway, between the Yellowstone river and the famous Rosebud Butte and has a population of 300. It has two hotels a public school, a general store and a ferry.

It is a thriving town and an important trading center for a large territory on both sides of the Yellowstone river and for the entire Rosebud River Valley.

SANDERS COUNTY.

Sanders county has an area of 2,803 square miles, an assessed valuation of $4,406,985 and a population of 3,713*. The county lies in the extreme western part of the state and the greater percent of its area is mountainous and well timbered. The Northern Pacific Railway runs through the county along the Clarks Fork River which waters the principal valley and if harnessed would furnish unlimited power for manufacturing purposes. The county has the very finest of fruit and agricultural lands and great coal

Harvesting Oats, Three Miles East of Thompson Falls.

and mineral resources. Sanders has 20 public schools, with school property valued at $95,432 and last year the county expended $47,126 for school purposes.

Thompson Falls.

Thompson Falls the county seat is situated on the main line of the Northern Pacific Railway and has a population of 800. The town has two public schools, also a high school, a hospital, a church, a newspaper, a bank, 2 hotels, 5 general stores and a fine system of water works. Lat year 15 new buildings were erected at a cost of $25,000. The County Court House cost $10,000, jail $5,000 and the new school house $17,000.

Thompson Falls is located on the Clarks Fork just above the falls for

Thompson Falls, Clark's Fork River.

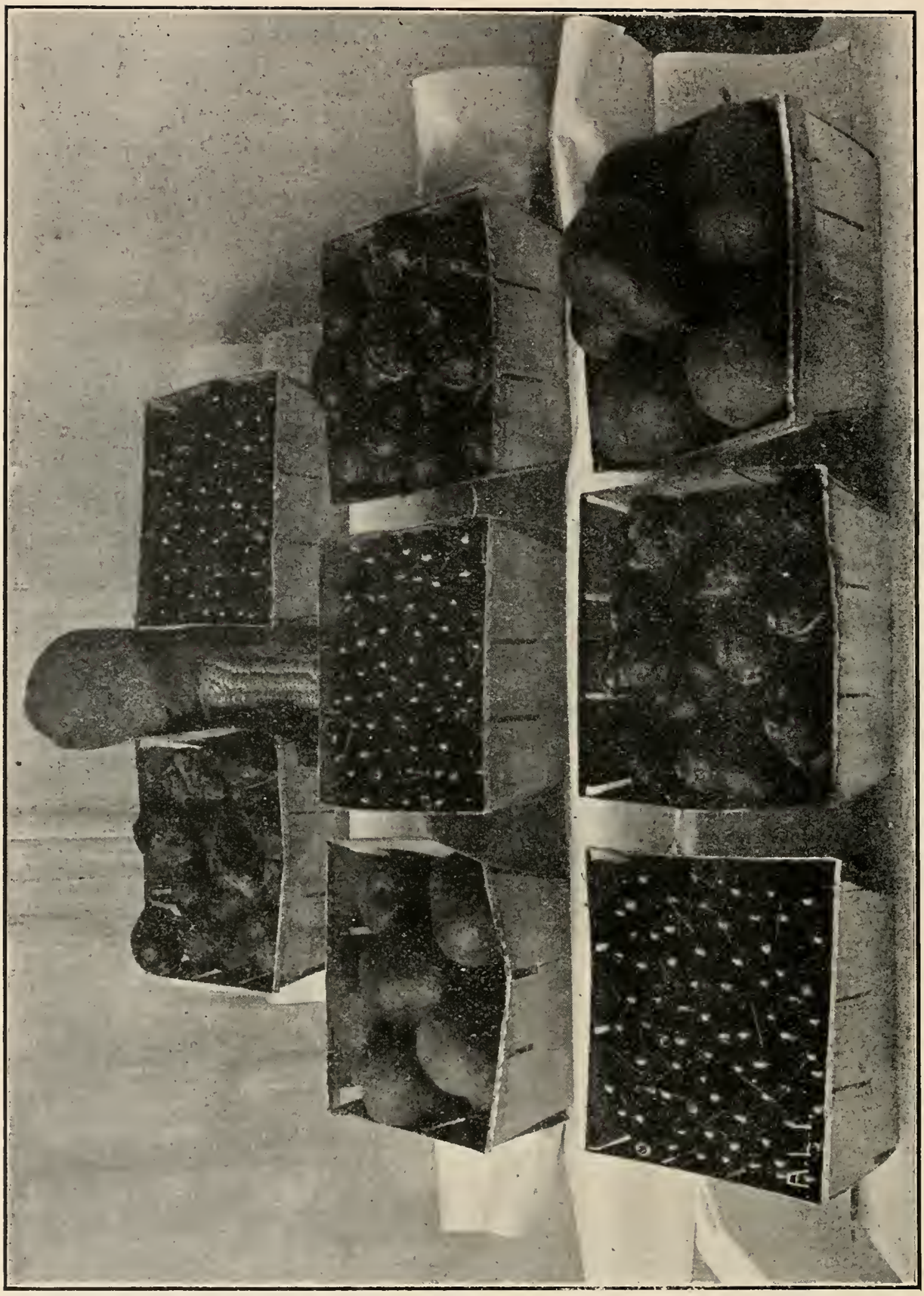
which it was named and which offers a splendid opportunity for the development of a magnificent water power. Great power for manufacturing purposes is simply a matter of time. Many thousands of horse power are going to waste and the river will not be left unharnessed at this point for many years.

In addition to the above the town has many resources of wealth including large tracts of timber, extensive mineral deposits and fruit and agricultural lands.

Plains.

Plains is situated on the banks of the Clarks Fork River on the Northern Pacific Railway and has a population of about 800. It has a water works system, a lighting plant, an elevator, a public school building which cost $25,000, 4 churches, 3 newspapers, 2 banks, a Commercial Club, 1 wholesale house and 10 retail stores.

Last year the town expended $25,000 on permanent improvements and



A Display of Sanders County Fruit.

18 new buildings were erected at a total cost of $90,000. Fuel is cheap and there is a large amount of water power available.

Plains is surrounded by first class fruit lands and enormous forests of the finest kind of timber.

Paradise.

Paradise is located on the Northern Pacific Railway, and has a population of 150.

The town has one school building which cost $10,000.00, one church, two hotels, four boarding houses, two drug stores and three general stores.

It is the terminal division point between Helena and Spokane. The N. P. Railway has a Tie Treating Plant and a roundhouse with twenty stalls and modern appliances which cost $500,000.00 and 125 men are employed. The N. P. gardens located here comprise 700 acres.

Quinns Hot Springs are four miles distant. Paradise is the junction point of the Coeur d'Alene branch with the main line of the Northern Pacific and as the name indicates is one of the garden spots of the Treasure State.

SILVER BOW COUNTY.

Silver Bow County is located on the Western Slope of the Continental Divide and has an area of 709 square miles with a population of 56,848*, and an assessed valuation of $36,880.475.

Silver Bow County has the distinction of being the smallest county in the State and the greatest in wealth and population. It contains the "greatest mining camp on earth," where the first copper was discovered in the State.

The greatest industry is mining and the area around Butte has been called "the richest 2,000 acres in the world." Other industries connected with mining have shown remarkable activity and would attract much more attention in other section; but is Silver Bow County they are simply overshadowed by the one great industry.

The State School of Mines is located at Butte the County Seat. Walkerville, Meaderville, Centerville and South Butte are to all intents a part of Butte.

The county has just built a new court house at a cost of $750,000.00. There are 35 public schools in the county with property valued at $978,877.00. Last year the county spent $355,204.00 for school purposes.

Butte.

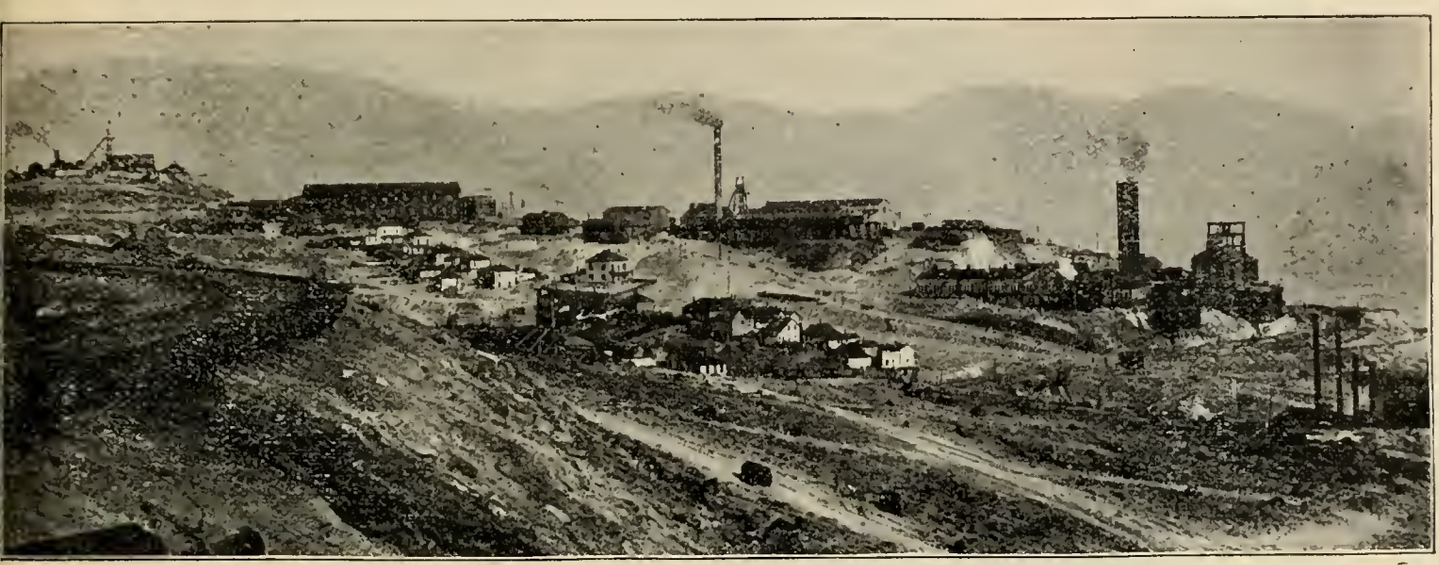
Butte, which is practically Silver Bow County is the county seat and has a population of 39,165*, making it the largest city in the state.

Here is to be found one of the most delightful climates that could be desired, the summer weather is par excellence and though the thermometer may rgister 90, yet the air is always cooling and the evenings pleasant. There is no humidity in the atmosphere to make it uncomfortable, such as has been the case in eastern cities during the past summer. One can sleep with a light covering which generally has to be added to before morning.

On the Richest Hill in the World.

The winters are refreshing and not so cold and penetrating as they are in lower altitudes. At no period during winter or summer can it be said that it is either too hot or too cold, and from the experience of some of the eastern cities during last summer many would have found great relief in Montana, where we have weather to suit the most fastidious.

Butte is a city of great importance commercially. With the immense output of copper from the mines, it necessarily follows that the pay-roll of some of the largest corporations of the world which are centered here are enormous, reaching a hugh total of $1,250,000.00 per month, and this does not include any of the commercial bodies and private concerns.



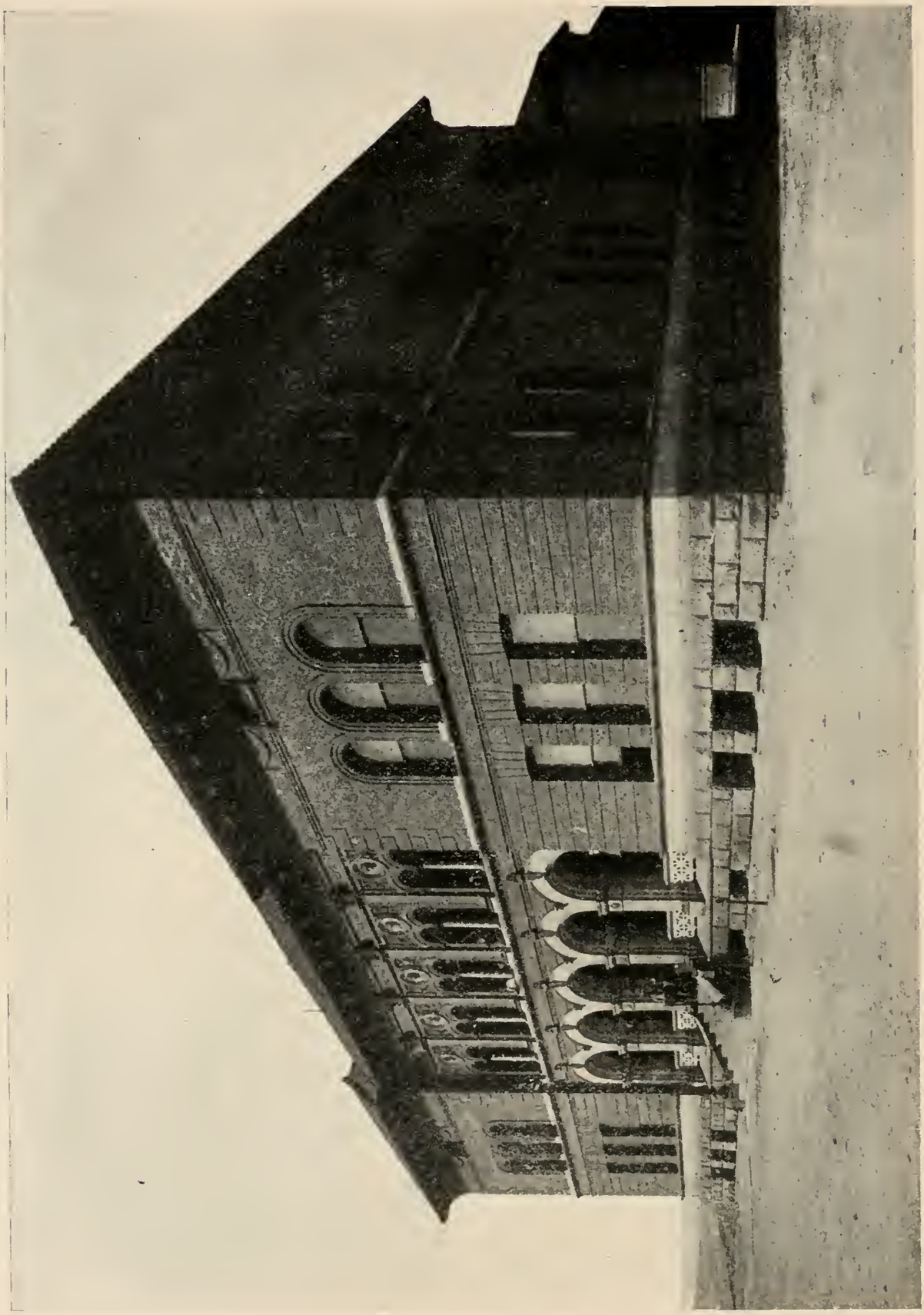
View of Anaconda Hill, Butte.

Four of the great transcontinental railroads center in Butte and it is the terminal point for the Butte, Anaconda & Pacific and Ruby Valley lines, and is it any wonder since figures prove that the freight paid to them is more than nine million dollars per annum or more than one thousand dollars per hour?

Butte in the past has been looked upon as a typical mining camp, but it passed this stage many years ago and is now a modern city with many elegant public buildings and beautiful homes.

The streets are electric lighted, clean and many of them paved. There are miles of cement sidewalks and a large number of business houses that are second to none in the west. The water supply for the city is abundant and the reservoirs which supply the water for domestic purposes as well as for fire protection are fed from the beautiful mountain streams which are so plentiful in the vicinity.

The educational advantages are of the highest character. From the State School of Mines some of our finest engineers are graduated, while the magnificent high school and the thirty public schools maintain their high reputation and make the city an important center of learning. There are seven large banking institutions with deposits aggregating over $15,000,000.00, which occupy stately structures and are equipped with safety vaults for securities. The financial standing of these banks has never been



State School of Mines, Butte.

questioned and though there is such an extraordinary pay-roll every month which the banks must meet they have never used clearing house certificates.

Three daily newspapers disseminate the news of the world to their numerous subscribers. The equipments of all the papers are of the highest tandard and the business and professional men advertise liberally.

In addition to the schools which have been mentioned, Butte has seven parochial schools, one industrial and several private and kindergarten schools. The public library is peculiarly adapted to the needs of the people. There are two hospitals with elegant buildings and both completely fitted with all the modern equipment necessary to the welfare of patients.

There are seven large hotels and a numbr of lodging houss which furnish accomodations for tourists and travelers with prices reasonable for all classes, all under good management and the large hotels are equipped with latest improvements.

The Silver Bow Club is located in the best part of the city and the hospitality shown by its members is known throughout the entire west. The Country Club which has just been finished is located within easy distance of the city and visitors are made welcome at all times.

Butte has been much misunderstood in the past, visitors believing that it was only a mining camp, but it is really a modern city. Additions are being created, new gardens made and numerous trees have grown adding much to the beauty of the city, since the city has been protected from th smelter smoke.

Churches of every denomination are to be found in Butte and are well supported and well attended; the pulpits being filled with men of learning, and nearly all the churches have excellent choirs. A large number of fraternal organizations have beautiful edifices with elegantly furnished lodge rooms.

The citizens of Butte point with pride to the Columbia Gardens, their greatest pleasure resort which is situated in a beautiful canyon near the crest of the Rocky Mountains and within easy access of the city by electric cars which run every few minutes. It has a magnificent pavilion, a fine ball park, a fish hatchery and a large animal managerie. Every specie of tropical plant can be found in the green house during the winter and they are transplanted to adorn the sloping hills of the gardens in the summer time. The Lake is one of the attractive features of the resort with a bath-house and row boats for the amusement of the larger children.

It is impossible to give an adequate idea of the resources, industries and advantages of this great western city.

It offers exceptional inducements to manufacturers and investments of all kinds, and while there are various factories such as brick, macaroni, candy, broom, mattress, etc., there is yet room for many others.

The city has 32 wholesale houses, 250 retail stores, 2 creameries with an annual output of 9,000,000 lbs., valued at $2,500,000.00.

Last year the city expended on permanent improvements $151.984.56 and 289 new buildings were erected at a total cost of $527.676.00.

In addition to the city and county buildings it has the largest federal building in the state.

After all Butte's great industry is mining. Twenty years ago, the knowing ones gave Butte just 20 years in which to exhause all her mineral wealth, but today with two great mines at a depth of 2,800 feet and many others below the two thousand foot level, the wealth of ore in sight is much greater than it has ever been in the past. Butte produces 30 per cent of the copper mined in the United States and 18 pr cnt of the world's output. It has 150 mines which produce 15,000 tons of ore daily, and yield an annual product of 300,000,000 pounds of copper, 12,000,000 ounces of silver and $1,500,000.00 in gold. It is easy to predict a great future for Butte with a pay-roll from the mines alone of more than $1,000,000.00 per month.

SWEET GRASS COUNTY.

The area of the county is 2,863 cquare miles, the total assessment of taxable wealth is $5,604,834.00 and the population of the county is 4,029*.

The soil is very productive and the range is still covered with the nutritious bunch grass which has made Sweet Grass in common with other eastern counties a great producer of livestock, sheep and wool.

The county has large areas of rich farming and fruit lands and immense deposits of mineral wealth. Some of its natural scenery is not surpassed even by the wonders of the great National Park and it still contains many desirable fishing and hunting grounds.

The County High School is located at Big Timber and in addition Sweet Grass has 36 public schools, with school property valued at $67,737.00 and last year the county expended $23,791.00 for school purposes.

Big Timber.

Big Timber is the county seat and the largest town in the county, it is situated on the main line of the Northern Pacific Railday at the confluence of the Boulder river, from the south and Big Timber and Otter Creek, from the north with the famous Yellowstone river.

Main Street, Big Timber.

Court House, Big Timber.

Big Timber has a population of 1400. The town has electric lights with arc lights on the streets. Five miles of concrete walks have been put down, and recently at a cost of $60,000.00, a system of gravity water works has been installed. The County Court House is a modern building, steam heated and electric lighted and built of native sand-stone.

It has a public school and a high school, each occupying commodious and modern brick and stone buildings. It has a theatre, a newspaper, and the following churches: Catholic, Congregational, Methodist and Scandinavian.

The amount of $70,000.00 was expended on permanent improvements last year and in addition six business blocks and twenty residences were erected at a cost of $60,000.00. Big Timber has one elevator with a capacity of 40,000 bus., a creamery with an output of 60,000 lbs. of butter last year worth $16,200.00. The City Hall cost $5,000.00 and the Court House $10,000.00. The city has a hospital, two banks, a club, two hotels and twelve retail stores. The cost of coal is from $2.50 to $3.50 per ton. The water power available is 26,000 H. P., with 60 H. P. developed. It is now the center of very extensive livestock, farming and irrigation activity and in the near future will necessarily become the industrial center of a large

section of country rich in gold, silver, copper, lead, iron, coal and timber.

The county has a number of small towns which supply the business necessary to the different sections of the county.

Sweet Grass boasts of one of the best constructed irrigation systems in the Northwest, owned by the Glass-Lindsay Land Company, containing 30,000 acres of fruit and general farm lands.

School House, Big Timber.

TETON COUNTY.

Teton County has an area of 7,466 sq. miles, an assessed valuation of $8,324.483.00 and a population of 9,546*. Livestock and wool are the great sources of revenue. The county has a large area of arable land and the irrigation projects, described in another article, will make a large increase in its agricultural wealth. There are large mineral deposits along the eastern slope of the Rocky Mountains which lies in the western part of the county.

Two lines of the Great Northern Railway cross the county, one from east to west and the other from north to south. In nearly all of the county the surface is level, the soil is fertile and free from stone and there is an abundant water supply.

The county is making rapid progress and offers many opportunities for industrial enterprises. The county has a high school located at Chou-

Harvesting near Valier.

teau and 27 public schools and school property worth $53,150.00. Last year the sum of $46,640.00 was expended by the county for school purposes.

Chouteau.

Chouteau is the county seat and has a population of 700. The city has two banks, three hotels, three churches, a newspaper, twelve retail stores, a school building which cost $20,000.00, a county high school building which cost $15,000.00 and a creamery with an annual output valued at $60,000.00.

Chouteau is situated in the heart of a rich agricultural district and is well served by irrigation plants taking water from the Teton river. Early in the development of agriculture in the state, progressive men realized the importance of irrigation and took the necessary steps and invested sufficient capital for fixing upon the valuable soils in the vicinity of Chouteau the water rights which have become valuable and have made this district a most prosperous farm, stock and dairy section.

In parts where irrigation is not yet established, dry farming is being practiced with good success, a few years of storage of moisture by cultivation proving the value of this system.

A Ranch on Burton Bench, Teton County.

Chouteau is well supplied with good pure water for domestic purposes and the city could develop about 250 H. P. and could take care of a flour mill with an electric light plant attached because it has the water power and the wheat and the local trade.

Elevators at Valier.

Dutton.

Dutton is on the Great Northern Railway, and has a population of 200, a school house, one bank, a club, two hotels and five retail stores. Last year $40,000.00 was spent on permanent improvements and 30 new buildings were erected at a cost of $35,000.00. The town is about nine months old and is located on the Sun River Reclamation Project. The Government canals will soon reach Dutton and will make agriculture its chief industry.

Cut Bank Creek.

Brady.

Brady is on the Great Northern Railway, and has a population of 101, one bank, two hotels, two general stores and two supply houses. This year 20 new buildings have been erected at a total cost of $20,000.00.

The town has water works and is fortunate in having free water. It is surrounded by magnificent agricultural empire. The Bynum reservoir holds 87,000 acre feet of water which will be conducted by a canal 30 feet wide to the lands surrounding Brady.

Conrad.

Conrad is located on the Great Northern Railway at a junction of a branch line with the main line and has a population of about 1200. Last

Plowing Near Valier

year the city spent $4,500 on permanent improvements and 60 buildings were erected at a cost of $150,000.00. It has city water works, electric lights, three elevators with a combined capacity of 90,000 bus., a public school, also a high school, a hospital, Catholic, Dutch-Reformed, and Presbyterian churches, newspapers, two banks, a club, four good hotels and six general stores. Conrad is the gateway to the great Conrad-Valier Project and has a tributary of 300,000 acres of irrigated land and 500,000 acres of good dry farming land.

Valier.

Valier is located on Lake Frances, a body of clear water which covers an area of 6,000 acres and is a terminal point of one of the branch lines of the Great Northern. One of the finest hotel buildings in Montana occupies one of the principal corners. It has a National Bank, a school, a newspaper, and two general stores.

The town is growing rapidly and promises to be an important busi-

ness center in the state. The land in the vicinity is level or gently rolling with a sufficient slope for drainage and is so smooth that it can be traversed in every direction by automobiles.

Large deposits of coal of good quality are found in the vicinity.

Shelby.

Shelby is the junction point of the two transcontinental lines of the Great Northern Railway, and has a population of about 500. It has

Teton County Court House.

three good hotels, four general stores, a commercial club, Catholic and Methodist churches, a public school and a $20,000.00 opera house.

The Great Northern has just finished a fine depot and the town has just been incorporated. One hundred buildings were erected last year at a cost of $150,000.00. Arrangements have been made to install water

works and to light the town. Fuel is cheap and coal is plentiful. Thousands of settlers have located near Shelby this year and there is still much fine land vacant. A strong flow of natural gas has been developed near Shelby and it is hoped that it will provide a sufficient quantity for lighting and heating the town. The town invites investments in any industry with cheap fuel as an object.

Cut Bank.

Cut Bank is on the Great Northern Railway, and has a population of 200, two churches, three hotels, four general stores, a newspaper, a bank and many other business houses. It is a division point on the railroad with a monthly pay-roll of $10,000.00 and is surrounded by rich farming lands under the proposed St. Mary's Irrigation Project. It is situated on the border of the Black Feet Reservation and will be the distributing point for that rich reserve when thrown open.

Its resources are coal, stone, sand and first-class agricultural lands. Water power will be developed on the Cut Bank River. Last year a dozen new buildings were erected at a total cost of $75,000.00.

VALLEY COUNTY.

The county is located in the northeastern part of the state, it has an area of 13,264 square miles and a population of 13,630*, compared with 4,355 in 1900.

The assessment for the county this year is $8,582,424.00, a decided gain over $2,213,901.00 ten years ago. The Missouri river forms the southern boundary and the Milk river flows through the central part of the county. These with their tributaries furnish water for the broad fertile plains and valleys. Stock raising and wool are important industries and there are still large areas of grazing land which have not yet yielded to the army of new settlers, but the lands are being located at a rapid rate and the greater part of the county will soon be occupied by improved farms.

Extensive beds of coal are found in many localities and fuel is cheap. The present year has been one of remarkable growth for Valley County and she still has room for thousands of people who desire good homes.

The county has 44 public schools with property valued at $134,126.00 and last year the sum of $62,174.00 was expended by the county for school purposes.

Glasgow.

Glasgow the county seat of Valley County is situated on the banks of the Milk river and on the main line of the Great Northern with a population of 1158*. It has three banks, one club, two hotels, seventeen retail stores, one elevator, two public schools also a high school, one hospital, an opera house, a Carnegie library and four churches, Catholic, Congregational, Episcopal and Methodist.

The city has a splendid sewer system, also water works and a lighting plant both owned and operated by the city. Last year the sum of $77,000.00 was expended for permanent improvements and $100,000.00 for new buildings by the residents of the city.

Glasgow is a division point on the Great Northern Railway and the seat of the U. S. Land Office. The city has two newspapers and the county buildings are located here. For the investment of capital, Glasgow offers splendid openings for a creamery, an elevator, a flour mill and a sash and door factory. Coal is abundant and fuel is cheap.

Culbertson.

Culbertson is on the Great Northern Railway, and has a population of 528*. It has six general stores, two hotels, one of which was built last year at a cost of $40,000.00, two newspapers, Catholic, Methodist and Presbyterian churches and three banks.

Culbertson was recently incorporated. Last year a number of new residences were erected at a cost of $25,000.00. There is one public school

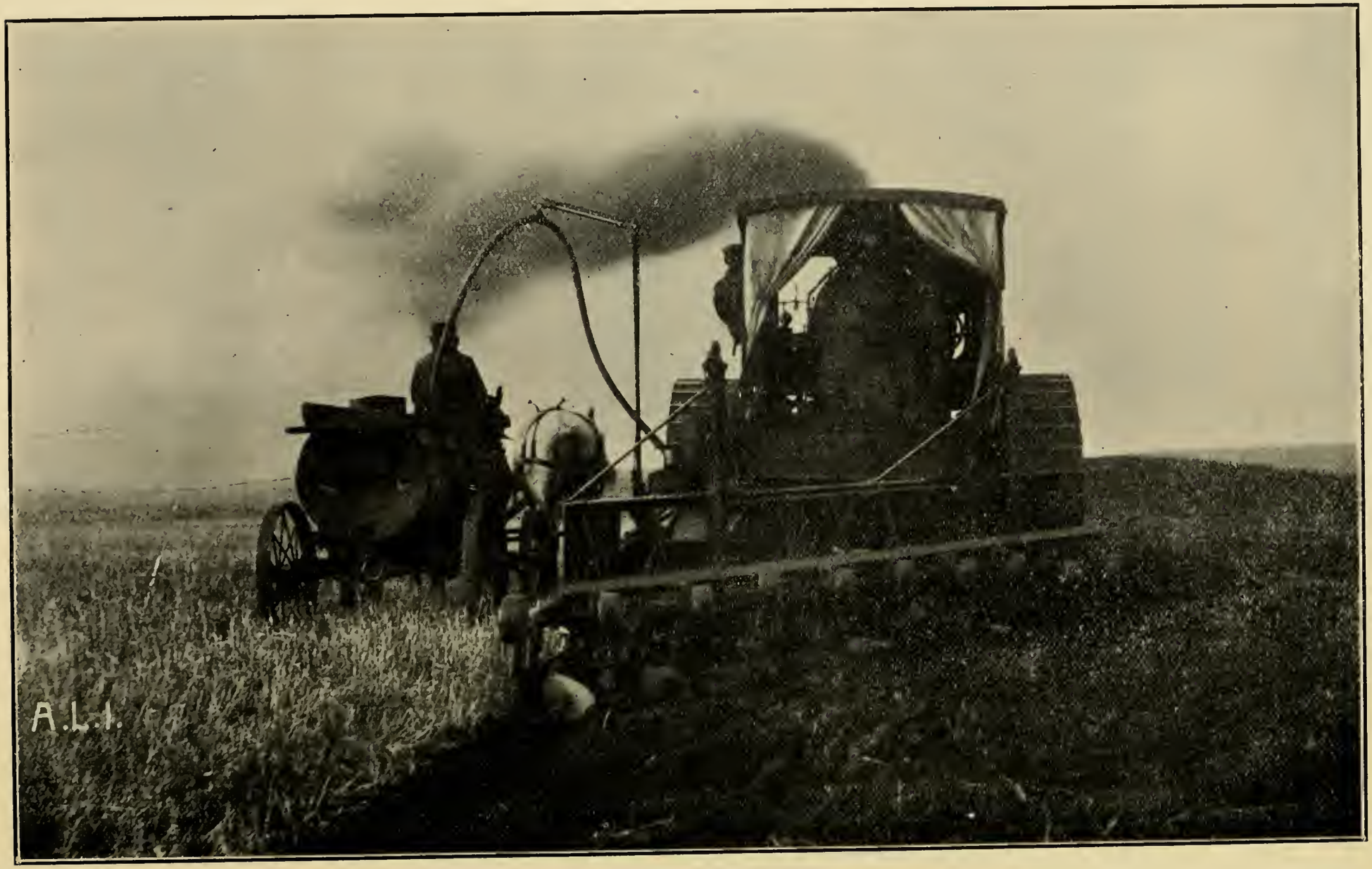
Court House and Jail at Glasgow.

also a high school and four elevators with a capacity of 100,000 bus.

The soil in the vicinity is, for the most part, a rich black loam with a clay sub-soil. Its productive qualities have been proven by the numerous large crops which have been raised from year to year. There are numerous springs and streams and a few lakes and water can be found at a depth ranging from 15 to 150 feet. Fuel is cheap, lignite coal abounds everywhere and is good fuel, burns freely and leaves few clinkers. The adjacent country produces sufficient quantities of wheat to supply a large flour mill which is very much needed.

Bainville.

Bainville is situated on the Great Northern Railway, at the junction of the main line with the branch line that goes north to the Medicine Lake country and has a population of 200. There were 60 new buildings erected last year at a total cost of $50,000.00. It has two elevators with a combined capacity of 50,000 bus., a public school, a newspaper, two



Plowing in Valley County.

churches, two banks, one club, one hotel, three general stores and a public hall which cost $4,500.

Medicine Lake.

Medicine Lake is on the new line of railway which has just been constructed north from Bainvlle and has a population of 150. It has a cement block and brick factory, three elevators with a capacity of 120,000 bus., a public school, a newspaper, two banks, a hotel and six retail stores. It is an important shipping point, fuel is cheap and a flour mill is much needed.

Plentywood.

Plentywood is the terminus of the new branch line of the Great Northery Railway, and the upper metropolis of the great Muddy Valley with a population of 200.

Last year 50 new buildings were erected at a cost of $75,000.00. It has two elevators with a capacity of 30,000 bus., a public school, a newspaper, a hospital, two banks, a club, two hotels, two restaurants, and twelve commercial houses.

Hinsdale.

Hinsdale is on the Great Northern and has a population of about 350. It has one bank, three hotels, two general stores, one hardware and furniture, one machine and implement, one drug store, one elevator with a capacity of 30,000 bus., a Methodist church and one public school.

The estimated cost of the new buildings erected last year is $75,000.00. The town is located on a beautiful elevation near the banks of the famous Milk river in the center of 40,000 acres of irrigable land. All the staple farm products do well and there are good openings for a flour mill, a woolen factory and cannery.

Wooldridge.

Wooldridge is located on the Great Northern at the foot of the famous Beaver Creek Valley near Bowdoin and Nelson Lake reservoirs, the former being noted as the great water fowl paradise. An extensive farming district is tributary and the Government canal is staked out along the border of the town.

Saco.

Saco is on the Great Northern Railway, and has a population of 300, Last year 34 new buildings were constructed at a cost of $45,000.00. It has one public school, a newspaper, a Methodist church, two banks, a commercial club and eight business houses. It is an important shipping point for cattle, horses, sheep and wool.

Saco is the center of a large body of good agricultural lands extending 60 miles north and south of the town.

Malta.

Malta is situated on the Great Northern Railway, and on the south bank of the Milk River about midway of the valley and has a population of about 800. Last year two miles of cement sidewalk were constructed and also 14 new buildings which cost $50,000.00.

It has an elevator, a school building which cost $10,000.00, a news-

paper, a hospital, Catholic, Episcopal and Methodist churches, two banks, three clubs, three hotels and 15 retail stores.

The valley at this point is wide, making about 20,000 acres of the choicest land that will come under the Government Reclamation system. The land is especially adapted to sugar beets, alfalfa and cereals.

In addition there are bench lands extending 50 miles both north and south especially adapted to the raising of all kinds of grains.

YELLOWSTONE COUNTY.

Yellowstone county has an area of 5,789 square miles. Its population is 22,944* compared with a population of 6,212 in 1900, and the valuation of taxable wealth amounts to $20,187,465.00 showing a wonderful increase over $5,178,688.00 ten years ago. The county derives its name from the Yellowstone River. Livestock is an important source of wealth, but it is surpassed by the agricultural industry. The soil is fertile and very productive. Water is plentyful and irrigation is practiced on an extensive scale. Grains, grasses and vegetables yield abundantly. Flax is a source

Corn on the Ranch of the Hon. W. B. George.

of great profit. Potatoes attain perfection and are in great demand for dining-car service. Sugar beets contribute a large amount toward the wealth of the county. Apples, grapes, plums, strawberries, melons and celery are also grown successfully.

The altitude is about 3,000 feet, the days of sunshine in the year outnumber those in other parts of the country and the climate is delightful. Yellowstone will always hold her place among the leading counties of the state.

The county has 40 public schools with property valued at $382,157.00 and last year the sum of $162,771.00 was paid out by the county for school purposes.

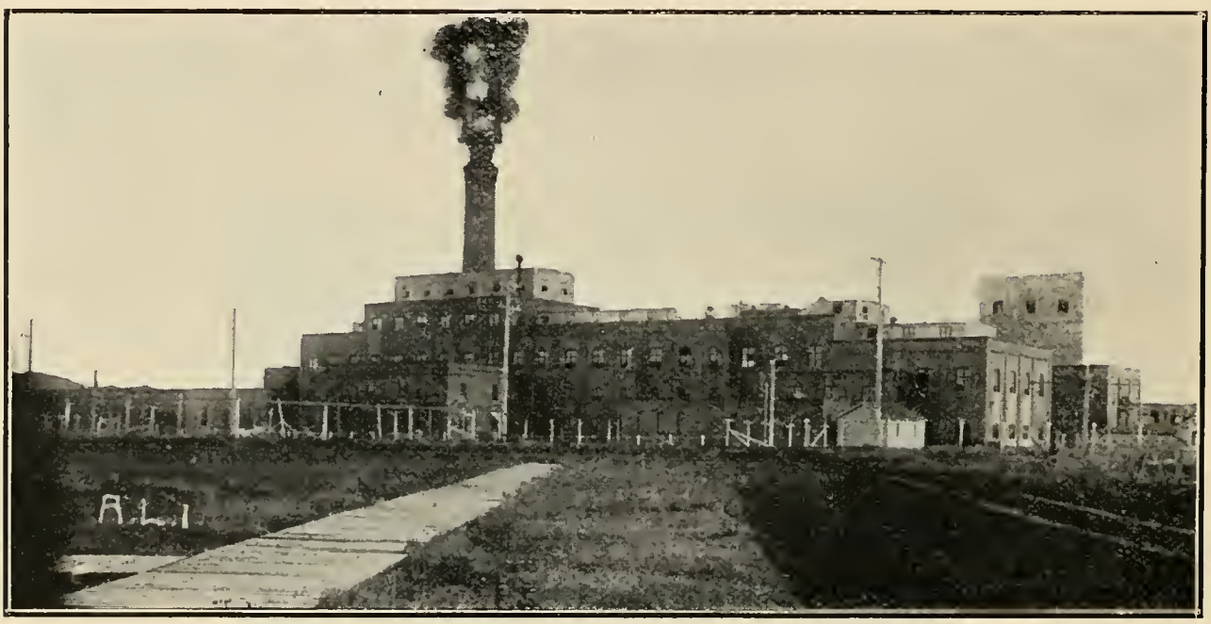
Billings.

Billings the county seat is situated on the Northern Pacific, the Burlington and Great Northern Railways, all transcontinental lines, and in addition the new "Gulf to Canada" line, a combination of the Burlington and Great Northern centers here. The population is 10,031*.

For the exploitation of its many opportunities and natural resources the location of Billings is ideal. It is the center of that vast agricultural region known as the "Midland Empire" and the market city of the greatest coal deposits of the west.

As a wholesaling and jobbing point, the railroad facilities enjoyed by Billings are alone sufficient to answer for its future. Modern business is awake to every opportunity and the location of 16 wholesale houses in the city shows that the larger mercantile establishments appreciate the situation.

Among the manufactures doing a thriving business at this point the Billings Sugar Company is easily first. Their annual output of beet sugar is about 25,000,000 pounds consuming the product of nearly 12,000 acres



Billings Sugar Factory, Cost $1,250,000.

producing about 200,000 tons of beets. One hundred and fifty men are employed by the company during the entire year, which number is increased to over 500 during the sugar-making season.

During the past year a new flour mill has been built which has a capacity of 600 barrels. An elevator holding 100,000 bushels is connected with it. The local brewery has a capacity of 25,000 barrels, a "1,000-cow" creamery in 1909 produced 200,000 pounds of butter worth $60,000.

At the present time the city has 43 manufacturing establishments in operation. There are 700 men on the payrolls receiving about $60,000 per month. Over $1,000,000 is expended annually for raw material and the finished product markets at between $2,000,000 and $3,000,000. The city has unlimited water power with ontly 3,000 horse power developed. Fuel is cheap. The electric power connections give the city over 100,000 horse power available for manufacturing purposes.

The city has 9 public school buildings, 2 high schools and also a polytechnic institute, 5 newspapers, 2 of which are daily, 1 hospital, 8 churches and many other public institutions including 4 theatres, 11 hotels and 7 banks with deposits of over $4,000,000.

It has a good water system, a sanitary sewer system and electric lights which deserve special mention, more than 50 electric signs are displayed and the principal streets are decorated with clusters of artistic globes making a veritable "White Way."

Last year 450 dwellings were constructed at a cost of $150,000. During the same period 43 new business blocks were completed which cost in the aggregate $1,000,000. The city has a Y. M. C. A. building which cost $100,000; the Elks Hall cost $110,000; Masonic Temple $125,000; the City Hall $75,000; Public Library $40,000; County Court House $125,000.

Garfield School, Billings.

The Northern Pacific has a round house and machine shops here with 250 men on the payroll, and the freight and passenger receipts in the city for all the railroads amount to $2,000,000 annually.

The post office records for the decade show an increase in this city of 387 per cent.

Agriculture will perform an important part in the development of the city. About 600,000 acres of irrigated land, very fertile and adapted to the production of cereals, fruits and vegetables, are tributary to this market and one half of this is located within a radius of 50 miles. The introduction of inter-urban lines throughout this section will increase the population, intensify farming, and add a series of business enterprises increasing the wealth and population.

Thousands of acres of non-irrigated farms are in successful operation and numerous free homesteads remain open for settlement. Good roads in the vicinity make easy transportation by means of vehicles and automobiles.

The Huntley project, one of the most successful reclamation projects in the country is located a short distance east of Billings. The city is an important supply point and is the market for 8,000,000 pounds of wool, 200,000 head of live stock, 200,000 tons of sugar beets, 250,000 bushels of potatoes, besides fruits and vegetables, and is the center of the "Turkey Red" wheat country and the flax belt.

Billings has a live and wide awake Commercial Club and also a Central Commercial Club representing Yellowstone and Carbon Counties.

There are openings for a cold storage plant, gas plant, pressed brick plant, condensed milk plant and all kinds of manufactories using electric power.

Laurel.

Laurel is on the Great Northern and Northern Pacific Railways and has a population of 2000. It has 2 public schools, 1 high school, 1 German school, 5 church buildings, 2 banks, 1 club, 7 hotels, 1 wholesale house, 25 retail stores, 1 creamery, electric light plant and $75,000 available for water and sewerage systems. A new $20,000 school building has just been completed and 150 new buildings were erected by individuals last year at a total cost of $175,000.

Laurel is the geographical center of one of the best agricultural and horticultural sections of the great west. The irrigated orchard lands are mines of wealth, no experiment is needed for the soil is of proven fertility, water is abundant and cheap, and harvests are as sure as taxes. A large percent of the bank deposits is owned by the farmers and mortgages are as rare as railroad passes. Within a radius of ten miles are 70,000 acres of irrigated land, watered by nearly 100 miles of canals. In this case "Irrigation means wealth" for it means hundreds of thousands of dollars in sugar beets, as much more in grain, as much in alfalfa and imposing sums for the potato crop. In the vicinity of Laurel a rancher cut 1,420 tons of alfalfa from 200 acres. Charles King whose ranch is close to Laurel gathered 1,213 bushels of potatoes from a single acre.

"Irrigation," is an interesting chapter in the history of Laurel's prosperity which can be read from the once blank pages of waste and sun baked lands which now tells in flaring lines of the farmer's plow furrow illustrated by beautiful orchards and fields of waving grain. Oats grown in the vicinity weigh 47 pounds to the measured bushel, or 46 per cent

NEW COURT HOUSE, BILLINGS.

heavier than the standard and there is a certainty of a crop every year, for with irrigation we have no droughts.

"Little drops of water,
On the grains of sand,
Make a mighty difference,
In the worth of land."

Columbus.

Is on the Northern Pacific Railway and has a population of 1,000. It is the distributing point for Absarokee, Busteed, Fishtail, and Nye City; has two miles of paved streets, water works, electric lights, a school building which cost $25,000, a Congregational church, a newspaper, 1 bank, 4 hotels, 5 retail stores, 1 elevator—capacity 25,000 bushels. New buildings erected last year cost $50,000, coal is cheap, many thousand horse power of water undeveloped. One of the best quarries of sand stone in the state is located near Columbus, which supplied the stone for the State Capitol Building. Good agricultural surroundings, with grain, hay, sugar beets, and fruits are the principal products. The city is situated near the confluence of the beautiful Yellowstone and Stillwater rivers, the latter leads through a valley magnificent in scenery to the Beartooth range. Splendid fishing and hunting territory contributes to the pleasure side of Columbus. The calm, pure, sweet and wholesome atmosphere of the city gives it a year round climatic excellence as an asset which will cause it to make good. The people who go to Columbus love it and are loath to leave it and those who leave return and determine never to leave it again.

Hardin.

Hardin, is on the Burlington Railway, on the west bank of the Bighorn river just across from the ruins of old Fort Custer. Hardin is only two years old and has a population of 400, has 1 large hotel, 1 national bank, 2 churches, 3 general stores, 2 hardware stores and a $20,000 school building is in course of construction. A water system conveys good water to all parts of the town. There is a large farming territory and grazing country tributary to Hardin.

Huntley.

Huntley is on the Northern Pacific and C. B. & Q. Railways, and has a population of 200. It is situated on the Yellowstone river and is the trading point for the first government reclamation project in Montana. Last year ten new buildings were erected at a cost of $20,000. It has a public school, 2 churches, 1 bank, 1 hotel, 14 retail stores and 1 elevator with a capacity of 30,000 bushels.

It has no water power developed but the immense power of the Yellowstone river is available. The town is the central point for small units whre intensified farming is practiced. It has pickling works and is in great need of a canning factory.

Broadview.

This town is on the Great Northern Railway and has a population of 250. Last year 30 new buildings were erected. It has a public school, 2 churches, 2 banks, 1 club, 2 hotels and 2 retail stores. Fuel is cheap and

the tributary territory contains large coal deposits and good farming lands.

Ryegate.

This is a new town on the C. M. & P. S. Railway, and has a population of 200. It has 1 public school, 1 bank, 1 hotel, and 2 general stores Fuel is cheap. It is an important town in the northern part of the county and is growing rapidly.

Custer.

Custer is on the Northern Pacific Railway and has a population of 100 Last year 12 new buildings were erected at a cost of $10,000. It has a public school, 1 bank, 2 hotels, 2 general stores and is a growing town in the center of a good farming country where irrigation is generally practiced.

Sheep and Wool.

The Bureau is indebted to the Annual Wool Review, issued December, 1910, by the National Association of Wool Manufacturers, for the following valuable information concerning sheep and wool, a study of which will prove of interest to the Montana grower.

(From the Annual Wool Review.)

In the pages which follow we present for the twenty-second consecutive year our annual estimate of the domestic wool product based upon the number of sheep fit for shearing April 1, 1910, together with numerous tables relating to sheep in various countries, the wool product, and the manufactures of wool and their importation. We have followed our accustomed lines in gathering information, and we desire to acknowledge our indebtedness for valuable assistance to sheepmen and others who have responded to our inquiries with helpful answers. We have no purpose to serve except to secure the most accurate information possible under prevailing conditions; and in this effort we have given due consideration to the views of the best informed wool growers, wool buyers, and dealers, and to the reports of officials in States where sheep are assessed for taxation. The result, it must be remembered, is an estimate and not an enumeration.

The Number of Sheep.

We place the number of sheep fit for shearing at 41,999,500, a decrease of 293,705 from 1909, when the total stood at 42,293,205. This decrease occurs in the estimated number of sheep in the far Western States, which in 1909 were credited with 28,125,000 and now have 27,250,000, a falling off of 875,000, due largely to the excessive cold and storms of the winter of 1909-1910 in the Rocky Mountain Region. The sheep in the Southern group of States are estimated now at 1,915,000, a loss of 25,000 from the 1,940,000 of 1909. There has been an increase, however, in the Eastern and Middle Western States, the number of sheep of shearing age in that group standing in our estimate at 12,834,500, a gain of 606,295 from the 12,228,205 of 1909.

Wool Product.

The total clip, excluding pulled wool, according to our estimate, is 281,362,750 pounds, a decrease of nearly 6,000,000 pounds as compared with last year. The scoured equivalent is 112,605,813 pounds, a decrease of less than 1,000,000 pounds from last year, due largely to the lighter shrinkage of the wools in the present season.

The detailed statement of number of sheep, weight of fleece, with percentage of shrinkage of wool product and the equivalent in scoured wool, the average value per pound for five years and the total value of this year's clip will be found in Table I., opposite.

In this table for convenience the States have been arranged, as in years past, in three groups, the first embracing all those north of the Ohio River and east of the western boundary of Missouri, including Kentucky, Maryland, and West Virginia, in which the fleece wools, fine and medium, are of comparatively light weight and shrinkage; the second comprising the southern States, where only medium wools are grown, except Texas, and the third comprising all the States west of the Missouri line, including Texas, New Mexico, and Arizona, where the great bulk of the fine, fine medium, and medium wools of heavy weight and shrinkage are produced.

In the first group are found 12,834,500 sheep, or 35 percent of the total flock, producing 81,950,000 pounds of wool in the grease, or 29 per cent of the whole product of 281,362,750 pounds, exclusive of pulled wool. In the third section 27,250,000 sheep, or 65 per cent of the total flock, produced 191,998,750 pounds of wool, or 68 per cent of the total clip.

In scoured condition the wools of the first group, owing to their lighter shrinkage, yielded 42,542,885 pounds, or nearly 38 per cent of the total, while the third group produced 65,602,038 pounds, or 58 per cent of the whole.

When the value is considered it is found that the wools of the first group brought $20,874,283, or 36 per cent of the total value of $57,479,838, and the third group's clip was valued at $34,700,024, or 60 per cent of the total. The production of the second group, although including ten States, is comparatively small, not much attention being paid to the sheep industry, although large areas of this section of the country are admirably adapted to wool growing and sheep raising. The number of sheep and the quanity of wool grown are about the same as for a number of years past, being for this year 1,915,000 sheep, producing 7,414,000 pounds of wool in the grease, which, shrinking about 40 per cent, yields 4,460,890 pounds of clean wool, valued at $1,905,531.

WOOL PRODUCT OF

States and Territories.	Quality.	No. of Sheep of Shearing Age, April 1, 1910.	Average Weight of Fleece, 1910.
			Pounds
Maine	Medium	210,000	6
New Hampshire	25% fine, 75% medium	70,000	6
Vermont	20% fine, 80% medium	180,000	6.5
Massachusetts	Medium	35,000	6.2
Rhode Island	"	7,500	5.3
Connecticut	"	35,000	5.25
New York	33% fine, 67% medium	825,000	6
New Jersey	Medium	50,000	5.5
Pennsylvania	60% fine, 40% medium	1,050,000	6
Delaware	Medium	7,000	5.5
Maryland	"	130,000	5.2
West Virginia	75% fine, 25% medium	600,000	5.75
Kentucky	Medium	800,000	4.75
Ohio	60% fine, 40% medium	2,600,000	6.5
Michigan	25% fine, 75% medium	1,700,000	6.75
Indiana	15% fine, 85% medium	900,000	6.5
Illinois	25% fine, 75% medium	700,000	7
Wisconsin	20% fine, 80% medium	900,000	6.75
Minnesota	20% fine, 80% medium	375,000	6.8
Iowa	30% fine, 70% medium	800,000	6.75
Missouri	15% fine, 85% medium	860,000	7
		12,834,500	6.38
Virginia	Medium	365,000	4.5
North Carolina	"	204,000	3.75
South Carolina	"	50,000	3.75
Georgia	"	225,000	3
Florida	"	115,000	3.25
Alabama	"	160,000	3.5
Mississippi	"	150,000	4
Louisiana	"	155,000	3.7
Arkansas	"	200,000	4
Tennessee	"	291,000	4.25
		1,915,000	3.87
Kansas	Fine, fine medium, and medium	175,000	7.5
Nebraska	" " " "	250,000	6.5
South Dakota	" " " "	625,000	6.5
North Dakota	" " " "	270,000	6.5
Montana	" " " "	4,800,000	7
Wyoming	" " " "	4,650,000	7.75
Idaho	" " " "	2,600,000	7.3
Washington	" " " "	450,000	9
Oregon	" " " "	1,750,000	8.25
California	33% fall, 67% spring	1,900,000	7
Nevada	Fine, fine medium, and medium	850,000	7
Utah	" " " "	2,100,000	6.75
Colorado	" " " "	1,400,000	6.5
Arizona	" " " "	825,000	6
New Mexico	" " " "	3,200,000	6
Texas	25% fall, 75% spring	1,325,000	6.75
Oklahoma and Indian Territory	Fine, fine medium, and medium	80,000	6.5
		27,250,000	7.05
Totals		41,999,500	6.7
Pulled Wool		.....	....
Total Product, 1910		.....	....

THE UNITED STATES—1910.

Wool Washed and Unwashed, 1910.	Per cent of Shrinkage, 1910.	Wool Scoured, 1910.	Average Value per Scoured Pound, Oct. 1.					Total Value, 1910.	State and Territories.
			1906.	1907.	1908.	1909.	1910.		
Pounds		Pounds	Cents	Cents	Cents	Cents	Cents		
1,260,000	40	756,000	58	56	43	55	45	$ 340,200	Maine.
420,000	50	210,000	57	55	44	57	49	102,300	New Hampshire.
1,170,000	51	573,000	56	55	45	57	49	280,917	Vermont.
217,000	42	125,860	57	56	44	56	45	56,637	Massachusetts.
39,750	42	23,055	57	56	44	56	45	10,375	Rhode Island.
183,750	42	106,575	58	57	44	56	45	47,959	Connecticut.
4,950,000	48	2,574,000	59	58	47	58	50	1,237,000	New York.
275,000	47	145,750	59	58	45	55	46	67,045	New Jersey.
6,300,000	48	3,276,000	62	61	48	59	55	1,801,800	Pennsylvania.
38,500	45	21,175	55	55	45	55	46	9,741	Delaware.
676,000	43	385,320	55	55	44	55	45	173,394	Maryland.
3,450,000	49	1,759,500	60	57	49	64	57	1,002,915	West Virginia.
3,800,000	38	2,356,000	59	58	45	58	46	1,083,760	Kentucky.
16,900,000	51	8,281,000	62	61	48	64	55	4,554,550	Ohio.
11,475,000	50	5,737,500	60	59	46	58	49	2,811,375	Michigan.
5,850,000	45	3,217,500	57	56	44	57	46	1,480,050	Indiana.
4,900,000	50	2,450,000	55	54	42	56	46	1,127,000	Illinois.
6,075,000	47	3,219,750	60	58	40	56	42	1,352,295	Wisconsin.
2,550,000	48	1,326,000	53	52	42	55	42	556,920	Minnesota.
5,400,000	48	2,808,000	56	55	44	58	46	1,291,680	Iowa.
6,020,000	47	3,190,600	56	55	44	56	45	1,435,770	Missouri.
81,950,000	48.1	42,542,885	..	..	..	..	..	$20,874,283	
1,642,500	37	1,034,775	59	57	45	57	47	$ 486,344	Virginia.
765,000	42	443,700	55	54	40	56	42	186,354	North Carolina.
187,500	42	108,750	55	54	39	56	41	44,588	South Carolina.
675,000	40	405,000	55	54	40	57	41	166,050	Georgia.
373,750	40	224,250	55	54	40	56	41	91,943	Florida.
560,000	40	336,000	54	53	40	56	41	137,760	Alabama.
600,000	42	348,000	54	53	40	56	41	142,680	Mississippi.
573,500	41	338,365	55	53	40	57	41	138,730	Louisiana.
800,000	40	480,000	54	52	38	55	40	192,000	Arkansas.
1,236,750	40	742,050	58	57	45	57	43	319,082	Tennessee.
7,414,000	39.9	4,460,890	..	..	..	..	..	$1,905,531	
1,312,500	64	472,500	65	65	50	66	52	$ 245,700	Kansas.
1,625,000	60	650,000	65	65	50	66	52	338,000	Nebraska.
4,062,500	60	1,625,000	67	67	50	65	54	877,500	South Dakota.
1,755,000	60	702,000	67	67	50	65	54	379,080	North Dakota.
33,600,000	64	12,096,000	68	67	51	68	56	6,773,760	Montana.
36,037,500	68	11,532,000	69	67	49	67	55	6,342,600	Wyoming.
18,980,000	65	6,643,000	66	66	51	67	52	3,454,360	Idaho.
4,050,000	69	1,255,500	66	65	50	67	54	677,970	Washington.
14,437,500	68	4,620,000	68	68	52	70	53	2,448,600	Oregon.
13,360,000	66	4,522,000	67	64	41	64	46	2,080,120	California.
5,950,000	68	1,904,000	68	68	51	70	54	1,028,160	Nevada.
14,175,000	66	4,819,500	67	65	46	65	52	2,506,140	Utah.
9,100,000	65	3,185,000	65	63	42	68	47	1,496,950	Colorado.
4,950,000	65	1,732,500	65	65	47	67	53	918,225	Arizona.
19,200,000	65	6,720,000	63	60	45	65	51	3,427,200	New Mexico.
8,943,750	67	2,951,438	67	66	53	64	55	1,623,291	Texas.
520,000	67	171,600	63	61	44	67	48	82,368	Oklahoma.
191,998,750	65.8	65,602,038	..	..	..	..	..	$34,700,024	
281,362,750	60	112,605,813	63.8	62.3	46.6	63.6	51	$57,479,838	Totals.
40,000,000	27	29,200,000	54.3	50.2	41.6	58	51.75	15,010,000	Pulled Wool.
321,362,750	..	141,805,813	..	..	..	..	51.12 22.53*	$72,489,838	Total Product, 1910.

*Average value, unscoured

Weight and Shrinkage.

For a series of years the average weight and shrinkage for the whole country has been as follows:

	Average Weight.	Average Shrinkage.
	Pounds.	Per cent.
1901	6.33	60.6
1902	6.50	60.0
1902	6.25	60.8
1904	6.50	61.6
1905	6.56	61.3
1906	6.66	61.8
1907	6.60	60.6
1908	6.70	60.5
1909	6.80	60.9
1910	6.70	60.0

The table shows a general tendency towards heavier fleeces, with but little variation in the average shrinkage from year to year; this year the shrinkage is 60 per cent, and except in 1902 when it was the same, it is the lightest in ten years shown in the table. The winter of 1910 like that of 1902 was unusually severe, which, with a consequent lack of forage, accounts for the light average weight and smaller shrinkage.

Pulled Wool.

Although the quantity of pulled wool produced is always to some extent a matter of conjecture, our reports are substantiated by the systematic returns of the large packers who pull fully two-thirds of the total amount. Our estimate of the quantity of grease wool has been reduced, for this year from 41,000,000 pounds in 1909 to 40,000,00 pounds; but this reduction is offset by diminished shrinkage, not now exceeding an average of 27 per cent, resulting from the fact that brushing of sheep-pelts has become quite general among pullers. This makes the estimate of scoured wool 29,200,000 pounds, a slight increase over the previous year. Reports from slaughtering centers show increased receipts of sheep and lambs since June, consequent upon adverse foddering conditions in sections west of the Rockies, but, as the yield of wool from a summer pelt is only a half to three-quarters of a pound, the aggregate increase of wool derived from this source is comparatively small and by no means sufficient to compensate for earlier conditions.

A general division of the 29,200,000 pounds of scoured pulled wool is estimated as follows:

Fine and fine medium	16,000,000
Medium and coarse	13,200,000

These we subdivide into the market-grades with the average values for the year ending September 30, 1910.

	Pounds.	Value per pound, cents.	Total value.
Extra and fine A	4,000,000	62	$ 2,480,000
A super	8,000,000	52	4,160,000
B super	6,000,000	45	2,700,000
C and low super	1,200,000	30	360,000
Fine combing	6,000,000	58	3,480,000
Combing	3,500,000	48	1,680,000
Shearlings	500,000	30	150,000
	29,200,000	Average 51¾	$15,010,000

The total production of the country for 1910 including pulled wool is, therefore, 321,362,750 pounds, or 6,747,999 pounds less than the estimated product of last year and is equal to 141,805,813 pounds of scoured wool.

The next table (No. II.) presents a statement of the production of wol for a period of twenty-five years with the annual increase or decrease and the one following it (No. III.) gives the production for the same period reduced to the scoured equivalent, as has been shown in our yearly estimates:

TABLE II.—FLEECE AND PULLED WOOL, WASHED AND IN THE GREASE.

		Product.	Decrease.	Increase.
1888	pounds	301,876,121	293,829	.....
1889	"	295,779,479	6,096,642	.....
1890	"	309,474,856	.....	13,699,377
1891	"	307,401,507	2,073,349	.....
1892	"	333,018,405	.....	25,606,898
1893	"	348,538,138	.....	15,519,733
1894	"	325,210,712	23,327,426	.....
1895	"	294,296,726	30,913,986	.....
1896	"	272,474,708	21,822,018	.....
1897	"	259,153,251	13,321,457	.....
1898	"	266,720,684	.....	7,567,433
1899	"	272,191,330	.....	5,470,646
1900	"	288,636,621	.....	16,445,291
1901	"	302,502,382	.....	13,865,707
1902	"	316,341,032	.....	13,838,650
1903	"	287,450,000	28,891,032	.....
1904	"	291,783,032	.....	4,333,032
1905	"	295,488,438	.....	3,705,406
1906	"	298,715,130	.....	3,426,692
1907	"	298,294,750	.....	948,176
1908	"	311,138,321	.....	12,833,571
1909	"	328,110,749	.....	16,972,428
1910	"	321,362,750	6,747,999	.....

TABLE III.—SCOURED WOOL, FLEECE AND PULLED.

		Product.	Decrease.	Increase.
1888	pounds	136,591,955	3,964,730	.....
1889	"	134,795,350	1,796,605	.....
1900	"	139,628,220	.....	4,832,870
1891	"	139,326,703	301,517	.....
1892	"	145,300,318	.....	5,973,615
1893	"	151,103,776	.....	5,803,458
1894	"	140,292,268	10,811,508	.....
1895	"	125,718,690	14,573,578	.....
1896	"	115,284,579	10,434,111	.....
1897	"	111,365,987	3,918,592	.....
1898	"	111,661,581	.....	295,594
1899	"	113,958,468	.....	2,296,887
1900	"	118,223,120	.....	4,264,652
1901	"	126,814,690	.....	8,591,570
1902	"	137,912,085	.....	11,097,395
1903	"	124,366,405	13,545,680	.....
1904	"	123,935,147	431,258	.....
1905	"	126,527,121	.....	2,591,974
1906	"	129,410,942	.....	2,883,821
1907	"	130,359,118	.....	948,176
1908	"	135,360,648	.....	5,001,530
1909	"	142,223,785	.....	6,863,137
1910	"	141,805,813	417,972	.....

Value of the Wool Product.

The total value of the wool product for the year, estimated on the scoured price in Boston, October 1, was $72,489,838 for 141,805,813 pounds of wool. Last year 142,223,785 pounds were valued at $88,829,746. The average value per pound of the fleece wool was 51 cents and 51.75 cents for pulled wool.

	Fleece and pulled. Scoured.	Total value.	Value per pound.	
			Fleece.	Pulled.
	Pounds.		Cents.	Cents.
1901	126,814,690	$51,164,709	41.1	36.7
1902	137,912,085	60,679,127	45.2	39.7
1903	124,366,405	58,775,373	48.8	43.4
1904	123,935,147	64,948,959	54.1	46.7
1905	126,527,121	80,415,514	65.4	57.4
1906	129,410,942	79,721,383	63.8	54.3
1907	130,359,118	78,263,165	62.3	50.2
1908	135,360,648	61,707,516	46.6	41.6
1909	142,223,785	88,829,746	63.6	58
1910	141,805,813	72,489,838	51	51.75

The World's Wool Production and Consumption.

The following table compiles from the latest available official returns and estimates contains an approximate statement of the wool production of the world, from which it appears that the United States furnishes about one-ninth of the total estimated supply, Argentina one-seventh, and Uruguay nearly one-third as much, together they supply one-sixth of the total, while Australasia furnishes a quantity greater than both and equal to nearly one-third of the entire production. The total quantity from all Europe, including the United Kingdom, is less than the product of Australasia. These four divisions together furnish 60 per cent of the whole amount Together with British South Africa, which supplies over 100,000,000 pounds of wool, they furnish the bulk of the merino and English blood wools. The remainder, including some from Europe, consists mostly of coarse, low-grade wools, suitable mainly for making carpets, common blankets and similar goods.

WOOL PRODUCTION OF THE WORLD.
From the Latest Official Returns and Estimates.

COUNTRY.	WOOL.	
	Pounds.	
NORTH AMERICA:		
United States	321,362,750	
British Provinces	11,210,000	
Mexico	7,000,000	
Central America and West Indies	1,000,000	
Total North America		340,572,750
SOUTH AMERICA:		
Argentina	414,464,800	
Brazil	1,130,000	
Chile	20,754,000	
Peru	9,940,000	
Falkland Islands	4,324,000	
Uruguay	129,961,170	
All other South America reported	5,000,000	
Total South America		585,573,970
EUROPE:		
United Kingdom	141,939,600	
Austria Hungary	41,600,000	
France	78,000,000	
Germany	25,600,000	
Spain	52,000,000	
Portugal	10,000,000	
Greece	14,000,000	
Italy	21,500,000	
Russia (Europe)	320,000,000	
Turkey and Balkan States	90,500,000	
All other Europe	18,000,000	
Total Europe		813,139,600

ASIA:		
British India	50,000,000	
China	50,000,000	
Russia (Asiatic)	60,000,000	
Turkey (Asiatic)	45,000,000	
Persia	12,146,000	
All other Asia reported	1,000,000	
Total Asia		218,146,000
AFRICA:		
Algeria	33,184,000	
British South Africa	111,720,000	
Tunis	3,735,000	
All other Africa reported	13,000,000	
Total Africa		161,639,000
OCEANIA:		
Australasia	833,611,665	
All other Oceania reported	100,000	
Total Oceania	833,711,665	
Total world		2,952,782,985

NUMEER OF SHEEP IN THE WORLD ACCORDING TO THE MOST RECENT AVAILABLE STATISTICS AND ESTIMATES.

COUNTRY.	NUMBER OF SHEEP.	
NORTH AMERICA:		
United States—		
Contiguous	57,216,000	
Hawaii	102,098	
Porto Rico	6,363	
Philippine Islands	30,428	
Total United States (includes lambs)		57,354,889
Canada	2,728,740	
Newfoundland	78,052	
Mexico	3,424,430	
Central America	92,780	
Cuba	9,980	
British West Indies	17,365	
Dutch West Indies	22,385	
Guadeloupe	11,731	
Total North America		63,750,352
SOUTH AMERICA·		
Argentina	67,211,754	
Brazil (no estimate available)	.....	
Chile	4,224,266	
Uruguay	26,000,000	
Falkland Islands	688,705	
Colombia	746,000	
Other South America	409,040	
Total South America		99,279,765
EUROPE:		
Austria Hungary	13,974,428	
Belgium	235,722	
Bulgaria	8,131,004	
Denmark, Iceland, and Faroe Islands	1,502,925	
Finland	912,467	
France	17,460,284	
Germany	7,703,710	
Greece	4,568,158	
Italy	11,160,420	
Montenegro	400,000	
Netherlands	606,785	
Norway	1,393,488	
Portugal	3,150,000	
Roumania	5,655,444	
Russia in Europe (includes goats)	45,840,541	
Servia	3,160,166	
Spain	16,119,051	
Sweden	1,021,727	
Switzerland	209,997	
Turkey	10,000,000	
United Kingdom	31,249,353	
All other Europe	22,530	
Total Europe		184,478,200

NUMBER OF SHEEP IN THE WORLD—(Continued).

COUNTRY.	NUMBER OF SHEEP.	
ASIA:		
British India	21,824,229	
Ceylon	100,603	
Cyprus	301,669	
Japan	3,949	
Russia in Asia	23,356,557	
Turkey in Asia	45,000,000	
China (no estimate available)	.....	
Total Asia		90,587,007
AFRICA:		
Algeria	9,314,515	
British East Africa	3,740,110	
Cape of Good Hope	16,323,987	
Natal	945,477	
Orange River Colony	8,020,308	
Rhodesia	204,000	
Transvaal	2,810,053	
German East Africa	1,560,000	
Sudan	1,421,721	
Tunis	833,562	
All other Africa	477,523	
Total Africa		45,651,256
OCEANIA:		
Australia	92,044,874	
New Zealand	23,480,707	
Australasia	115,525,851	
Other Oceania	12,452	
Total Oceania		115,438,033
Grand World Total		656,639,502

The preceding table contains the most recent statistics obtainable of the number of sheep in the world. It will be noticed that no figures are given for Brazil or China, both of which countries, especially the latter, produce considerable quantities of wool, mostly of poor quality. It is probable that more complete statistics would increase the world's total to 700,000,000 head.

Consumption of Raw Wool on Principal Manufacturing Countries.

Comparative statistics of the quantity of wool consumed by the great wool manufacturing nations are very incomplete and imperfect, and except in the United States the reports of quantities used are usually estimates rather than the results of careful statistical inquiry. The latest comparative statement available is that contained in the Chamberlain Tariff Commission Report (London, 1905), from which the following table and comment are taken, and in that year 1902 is the only year in which a report is given for each of the countries named.

ESTIMATED RAW WOOL RETAINED FOR HOME CONSUMPTION IN THE PRINCIPAL MANUFACTURING COUNTRIES AND YEARS.* (In Million Pounds).

	Germany.	France.	Austria-Hungary.	Italy.	United States.	United Kingdom.
1875	159	†	†	†	248	351
1880	†	†	38	38	356	372
1885	251	391	†	†	374	365
1890	†	428	57	†	378	425
1895	410	441	†	49	514	503
1900	316	381	†	†	439	499
1902	380	457	132	59	480	492
1903	....	....	....	....	461	448
1904	....	....	....	....	462	437

* Based on official returns, estimates of the Bradford Chamber of Commerce and on Conrad's "Handworter buch der Staatswissenschaften."

† In these years figures for domestic wool production are not available.

"According to the table, the consumption of wool in the United Kingdom has risen by 86 million pounds, or 24 per cent between the years 1875 and 1904. In the same period, the consumption of wool in the United States has risen by 214 million pounds, or 87 per cent. In Germany, the increase from 1875 to 1902 amounted to 221 million pounds, representing 140 per cent on the consumption in the earlier year. In Austria-Hungary, the increase from 1880 to 1902 amounted to 250 per cent; and in Italy to 55 per cent. Thus in every country the percentage increase in the consumption of raw wood has been greater than in the United Kingdom; and in every case also, except in France and Italy, the increase in the amount consumed has been greater than in the United Kingdom."

The relative importance, as wool consumers of the several countries reported, is as follows:

United Kingdom	492,000,000	pounds.
United States	480,000,000	"
France	457,000,000	"
Germany	380,000,000	"
Austria-Hungary	132,000,000	"
Italy	57,000,000	"
	1,998,000,000	"

Together they consume almost 80 per cent of the world's annual wool production.

In the consumption of wool the United States is far and away in advance of either of the other great nations, for although somewhat behind the United Kingdom in the quantity required for her factories, all that is manufactured here is retained here for the clothing and other uses of our people, and in addition vast quantities of woolen fabrics are imported from abroad. A large percentage of the wool consumed in the factories of other countries is manufactured for export and sold for use beyond their borders, giving the United States a preeminence as a wool consuming country greatly in advance of its position as it appears in the Report.

WOOL IMPORTED INTO BOSTON, NEW YORK, AND PHILADELPHIA, BY PRINCIPAL COUNTRIES OF PRODUCTION.

Year Ending June 30.	Russia.	Turkey.	United Kingdom.	Argentina.	Uruguay.	Chinese Empire.	British East Indies.	British Oceania.	All Other Countries.	Total.
	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
1896	13,150,509	17,987,753	14,229,068	32,281,341	9,048,350	26,084,232	9,897,531	72,995,090	30,264,448	225,938,322
1897	19,706,449	20,238,717	27,759,419	64,969,556	15,004,257	21,461,478	10,989,980	109,912,851	42,451,335	332,495,042
1898	16,999,224	9,282,762	12,434,332	16,734,279	1,309,974	20,369,294	6,445,063	31,877,252	14,630,832	130,083,012
1899	13,373,350	5,697,377	9,156,624	7,957,657	149,573	14,276,124	6,949,491	7,249,740	10,688,700	75,498,636
1900	18,869,252	9,577,147	20,393,063	20,064,279	1,072,307	30,998,289	9,397,020	23,121,394	19,171,121	152,663,872
1901	13,720,814	8,355,941	16,919,793	14,358,218	783,075	9,181,105	4,146,698	22,570,030	11,482,847	101,518,521
1902	16,322,231	12,215,316	21,737,509	45,287,370	533,634	18,843,396	6,813,401	26,559,531	13,930,722	162,243,110
1903	19,455,392	15,440,933	31,778,842	23,265,309	541,384	26,032,976	11,850,446	25,238,498	18,390,678	171,994,458
1904	23,403,797	17,742,473	26,807,042	28,168,060	112,208	24,912,491	10,088,556	25,792,098	13,374,315	170,401,040
1905	23,790,451	23,454,937	25,213,450	47,695,567	7,740,309	30,023,157	12,202,135	56,212,733	16,460,214	242,792,953
1906	21,180,755	16,032,199	21,615,963	42,167,927	5,807,190	30,233,762	6,011,319	39,548,551	11,242,388	193,840,054
1907	21,231,387	15,710,735	14,863,620	23,195,208	5,856,611	39,762,115	8,697,581	52,538,582	12,338,352	194,194,182
1908	12,913,964	10,686,993	15,747,766	16,221,285	1,604,221	21,717,431	4,936,421	27,032,576	7,438,644	118,298,301
1909	7,966,392	10,050,199	31,125,711	58,379,834	5,868,232	35,634,909	12,952,758	79,420,778	12,189,107	253,587,920
1910	13,263,175	13,521,623	37,097,134	31,082,184	8,789,785	46,599,637	16,603,135	68,199,625	15,128,955	250,285,253

Note.—These figures represent about 95 per cent of the total quantity of wool imported into all ports of the United States.

TABLE X.—COMPARATIVE PRICES OF DOMESTIC WOOL IN BOSTON, OCTOBER, 1896-1909.

	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909
Ohio, Pa., and W. Va. (washed)														
XX and above	19	29½	29½	31½	28½	26½	28½	34	35	36½	34	34	33	36
Medium	19½	30½	30	34½	28½	26	29	32	36	41½	40	40	34	40
Fine Delaine	19½	30½	29½	34½	28½	28	31½	36	36	37½	36	38½	35	40
(Unwashed) Fine	13½	21	19½	22½	18½	19½	21½	23½	24	27	26	27	23	28
(Unwashed) Medium	15½	23	22½	25	23½	20	23	25	30	34½	33	33	26	36
(Unwashed) Fine Delaine	14	21	21½	24½	21½	21	24	26	27	30	28	31	28	33
Mich., Wis., N. Y., etc. (washed)														
Fine	15½	24	22½	25½	22½	20½	24	27½	27½	31*	30*	30*	28*	31*
(Washed) Medium	18½	29	27½	32	27½	24½	27	31	33	40	39	39	33	38
Fine Delaine	18½	27	27½	31½	25½	24½	29	34	34	36	34	37	34	38
(Unwashed) Fine	11½	18½	17½	20	16½	17	19	21½	22	25	24	25½	22	26
(Unwashed) Medium	15	22	22	22½	22½	19½	21½	24	29	33	32	32	25	34
Fine Delaine	13	19½	19½	22½	18½	19	22	23½	25	28	26	29	26	32
Ky. and Ind. (unwashed) Medium	16	23	22½	22½	24½	21	22½	24½	30	35	33	31	25	35
Mo., Ia. and Ill. (unwashed)														
Medium	15	22	21½	22	22½	19½	21½	23½	29	34	32	30	24	32
Texas (scoured basis) Spring, Fine,														
12 months	31	46	44	49	50	44	52½	52½	62	75	70	71	55	75
Fall, Fine	27	43	41½	44	41	37	45	42½	52	62	58	58	45	60
California, (scoured basis) Spring,														
Northern Free, 12 months	31	46	44	49	49	43½	50	52	62	74	70	68	50	70
Fall, free	27	42½	41	44	41	38½	43	42½	53	62	60	58	40	53
Mont., Wyo., Utah, Idaho, Ore.,														
etc. (scoured basis) Staple Fine	33	50	47½	55	51	46	55	55	65	76	71	73	60	78
Staple, Medium	30	48	45	50	48	44	50	51	60	70	66	68	52	70
Clothing, Fine	31	48	45	50	48	43	48	50	60	72	68	65	53	70
Clothing, Medium	27½	45	44	48	47½	40	45	46	55	68	63	60	45	65

* Nominal.

MONTANA SHEEP AND WOOL.

The number of sheep in the state was 4,486,085 in 1909 and 4,817,492 in 1910 as reported by the county assessors.

The following is from the report of the State Board of Sheep Commissioners:

The number of sheep assessed for 1910 exceeds the 1909 assessment by 331,407, and a like comparison shows that the number of sheep reported by assessors as on hand March 1, 1910, exceeds the number of sheep assessed March 1, 1908, by 643,604, a gain of over 15 per cent, a very healthy increase, and goes to show that the sheep industry of the state is keeping pace with all other industries, and that Montana still maintains her supremacy as the banner sheep and wool state of the nation, in spite of adverse claims made by some of our sister states. While the assessors returns for 1909 show but 4,486,085, a conservative estimate of the actual number of sheep in Montana shows the number to be about 5,600,000, and that number of pounds of wool produced in Montana in 1909 was about 43,000,000 pounds. This is borne out by the fact that in the year 1909 railroad reports show that the total shipment of wool during the season of 1909 aggregated 45,549,636 pounds.

In 1910 a conservative estimate of the number of sheep in the state was about 6,000,000, although the assessors returns show but 4,817,492, and the estimated amount of wool produced was about 43,800,000 pounds.

These estimates are based upon average returns from sheep owners in the different counties, and from mn who are in a position to know the actual facts, and from personal observation we know that assessors returns do not show the actual number of sheep in the State, owing possibly to

the fact that the lamb crop and scattered and missing bands can never be taken by the assessor.

The average price of wool in 1909 was about twenty cents per pound, and in 1910 about eighteen cents.

Taken all in all the wool industry in Montana is at present in a very prosperous condition, but with the increased cost of feed, labor, lands, etc., and the continued agitation in regard to tariff legislation, the closing out of large holdings of lands, and their division among the large number of immigrants from other states, will doubtless cause a large movement in the disposal of large holdings of sheep and will probably result in a falling off in the number of sheep in this state during the next year or two, until there is a definite settlement of matters that affect the industry.

The Board still holds to the sanitary measures adopted by it in recent years, and finds that regulations now in force concerning sanitary measures and regulations have met with universal success.

The following regulation adopted by the Board in 1908 not proving to the best interests of all concerned has been abrogated:

"Hereafter when any sheep are shipped in this state for the purpose of feeding, from clean districts occompanied by a federal inspector's certificate to the effect that said sheep were shipped from a clean district and were free from all infectious and contagious diseases, that they be dipped once and then kept in quarantine in close feed lots for five (5) months subject from time to time to such competent inspection as was deemed necessary by this Board or the State Veterinarian, and subject to final thorough inspection at the end of that period, and if found clean at said final inspection can be released without further dipping and furnished with a certificate to that effect.

"If said sheep are to be released from said quarantine at any time prior to the expiration of said five (5) months period they must be dipped the second time before being permitted to go on the range.

"All expense covering the inspection and treatment of this class of shipments must be borne by the owners thereof."

We are of the opinion that an appropriation of $20,000.00 for the two year ending February 28, 1913, will be ample for the expenses of carrying out the provisions of the act creating this Board, providing that due care is exercised in the expenditure of any fund thus created, and providing further that due provision is made for payment of the transportation expenses of the inspectors of this Board.

Heretofore inspectors have been provided with free transportation by the different railways in the state, but under the decision of the supreme court doing away with free transportation to state officials, etc., it will be necessary that means be provided to furnish transportation to the inspectors of this department. A conservative estimate of the amount that will be required to furnish transportation to the inspectors of this department will be not over $2,500.00 per year.

AGRICULTURE IN THE UNITED STATES.

The Bureau is indebted to the Annual Report of the Secretary of Agriculture for the following valuable summary of agricultural productions in the United States in the year 1909:

Value Much Higher Than for Any Previous Year—Most Prosperous of All Years.

Most prosperous of all years is the place to which 1909 is entitled in agriculture. The yield has been bountiful with most crops, and prices have been high. Advantageously situated as he is in most respects, the farmer is less and less generally compelled to dump his crops on the market at the time of harvest. He does not need to work for his board and clothes, as he often did in the former time when prices were so low as to be unprofitable.

Value of All Products.

The value of the farm products is so incomprehensibly large that it has become merely a row of figures. For this year it is $8,760,000,000; the gain of this year over the preceding one is $869,000,000.

Ten years ago the value of the products of the farm was only five and one-half times the mere gain of this year. The value of the products has nearly doubled in ten years.

If the total value of the farm products in 1899, as established by the census, is placed at 100, the value for 1903 is represented by 125, for 1904 by 130, for 1905 by 133, for 1906 by 143, for 1907 by 159, for 1908 by 167 and for 1909 by 186.

Eleven years of agriculture, beginning with a production of $4,417,000,000 and ending with $8,760,000,000. A sum of $70,000,000,000 for the period.

It has paid off mortgages, it has established banks, it has made better homes, it has helped to make the farmer a citizen of the world, it has provided him with means for improving his soil and making it more productive.

CHIEF CROPS.

In the statement that follows concerning the crop quantities and values for 1909 no figure should be accepted as anticipating the final estimates of this Department to be made later. Only approximations can be adopted, such as could be made by any competent person outside of this Department.

Corn.

The most striking fact in the world's agriculture is the value of the corn crop of 1909 in this country. It is about $1,720,000,000.

It nearly equals the value of the clothing and personal adornments of 76,000,000 people, according to the census of 1900. The gold and silver coin and bullion of the United States are not of greater value.

This corn came up from the soil and out of the air in one hundred and twenty days—$14,000,000 a day for one crop, nearly enough for two dreadnoughts daily, for peace or war.

The value of this corn crop is the highest of record and it is greater than the average of the five preceding years by 36 per cent, while the farm price per bushel is greater by 32 per cent. The price per bushel on November 1, 62.2 cents, has been exceeded in only two years in the record of the Department of Agriculture, beginning with 1866.

In quantity of production this year's corn crop stands second, with 2,767,000,000 bushels, being exceeded by the corn of 1906, but it is greater than the average crop of the five preceding years by 3.5 per cent.

Cotton.

Cotton is now by far the second crop in value, and this year's crop is easily the most valuable one to the farmer that has been produced. With cotton lint selling at 13.7 cents at the farm November 1, and cotton seed selling for about $25 per ton, the lint and seed of this crop are worth about $850,000,000 to the farmer. No other cotton crop since 1873 has been sold by farmers for as high a price per pound as this one.

There have been three cotton crops of more than 13,500,000 bales of 500 pounds gross weight, the first being in 1904, and commercial expectations are that the crop of this year will be below the average of the five preceding years.

Wheat.

Third in order of value among the crops is wheat, worth about $725,000,000 at the farm, and this exceeds all previous values by a large amount. The November farm price was almost an even $1 per bushel, and its equal cannot be found until as long ago as 1881. The total value of this year's crop is greater than the five-year average by 34.6 per cent.

In 1901 and 1906 slightly larger crops of wheat were produced, so that the yield of this year, 725,000,000, is third in size.

Hay.

For years hay and wheat disputed with each other the honor of the place next after cotton in value, but this year the separation is distinct, and hay with its value of about $665,000,000, is considerably below wheat and far below cotton. Only in one year, 1907, has its value been overtopped and it is ten per cent above the five-year average. The quantity of the hay crop, 64,000,000 tons, has several times been greater than it is this year, although it is now 2.6 per cent above the average of five years preceding.

Oats.

The fifth crop in order of value is oats, worth this year at the farm about $400,000,000, which is considerably above high-water mark, and is greater than the five-year average by 28 per cent. The price of November 1, 41 cents, is high, and only in 1907 and 1908 has it been higher since 1890. In production this crop is nearly a leader, with its 984,000,000 bushels, and would have been a leader had not the crop of 1902 been about 4,000,000 bushels greater. It is greater than the five-year average by over 12 per cent.

Potatoes.

This years crop of potatoes is more valuable than any one before produced and is worth about $212,000,000. It is above the five-year average by 25 per cent. The November price, 57.8 cents per bushel, has often been exceeded.

The large production is what makes the crop so valuable, a production that has not been equaled; it is 367,000,000 bushels, or 24 per cent above the five-year average.

Tobacco.

Tobacco is not marketed under circumstances that secure a higher price per pound than farmers have received since 1865, except in two or three years. Since 1905 the farm price has been 10 cents or better. The farm value of this year's crop is a little under $100,000,000 and has not been equaled. It is nearly 50 per cent above the five-year average. This great value is principally due to the fact that the crop is the largest ever raised, with about 900,000,000 pounds, or one-third greater than the average of five years.

Sugar.

It is too early to forsee the amount of the beet sugar of this year's campaign, but the indications are about 500,000 short tons, or a greater crop than ever before produced. The value of the sugar and of the beet pulp for feeding purposes is about $47,000,000, an amount that has not been reached in any earlier year.

If the commercial estimate of 364,000 short tons for raw cane sugar is accepted, it is a little below the record of half a dozen years. The value of the cane sugar, molasses, and syrup is placed at $40,000,000.

With fulfillment of expectations, the entire sugar crop will be about 864,000 tons (refined beet sugar and raw cane sugar), and the value of all sugar, molasses and syrup, from farm and factory, will reach about $95,000,000, so that for quantity of total sugar and value of total sugar molasses and syrup, this year is a leading one.

Barley.

Barley has receded from its very high price of 1907, but still has a price, 53.3 cents per bushel November 1, which has not been equaled since 1890, except in 1907 and 1908. The farm value of this year's crop is nearly $88,000,000, which has been exceeded only twice, and is 15 per cent over the average of the previous five years.

The production, 165,000,000 bu., is third in quantity, although compared with five years before, it is 6 per cent higher.

Flaxseed.

The production of flaxseed seems to be declining, and the crop of this year is estimated at 25,767,000 bushels, a trifle under the five-year average. But the value of the seed per bushel, $1.398, is the highest since the Bureau of Statistics began to ascertain the farm price in 1902, and the crop is worth $36,000,000, or considerably more than ever before, and 40 per cent over the average of the previous five years.

Rice.

The estimate of rough rice production this year is a little over 1,000,000,000 pounds, an amount considerably above the highest previous crop. It is 21 per cent over the five-year average. The lead of the value is even more pronounced, since the price is high, and the total for the crop is about $25,000,000.

Rye.

Rye is a crop that remains at almost constant production, about 31,000,000 bushels, and the value this year is about $23,000,000, which has often been exceeded.

Hops.

A shortage in the world's crop of hops this year raised the price to a high figure, about 33 cents for New York and about 24 cents for the Pacific Northwest. It happened, however, that a large proportion of the Pacific coast crop had been contracted for last year at about 9 cents, so that the average price paid for the whole crop is not as high as market prices indicate. The quanity of the hop crop this year is below the five-year average, but the value is about $8,000,000, or next to the highest year.

All Cereals.

Although a bushel of oats weighs less than a bushel of other cereals, yet there is considerable significance in comparing the total quantity of all cereals in recent years. The total for 1909 is 4,711,000,000 bushels, an amount considerably greater than that for any other year except 1906, when the total was 4,872,000,000 bushels. The average of five years is exceeded in 1909 by 6.5 per cent.

The farm value of all cereals in 1909 has never been equaled in a previous year. It is almost exactly $3,000,000,000, or 34 per cent above the five year average.

Summary of Comparisons.

Compared with the average of the preceding five years, every one of the crops particularized in the foregoing was larger, except cotton, flaxseed, hops and cane sugar. Without exception every crop was worth more to the farmer than the five year average.

This is the year of highest production for potatoes, beet sugar, all sugar, tobacco and rice; a year of next to the highest production for corn, oats and all cereals; the crop third in size for wheat.

For value, the amount has not been equaled in the case of corn, cotton, wheat, oats, all cereals, potatoes, beet sugar, all sugar, flaxseed and rice; the year is next to the highest for hay, cane sugar and hops; and the barley crop is third in value.

Compared with 1908, this year's gains in value of farm products are found all along the line, the exceptions being barley, buckwheat, rye and milk. The increase for cotton-line and seed is $208,000,000; wheat, $107,000,000; corn, $105,000,000; hay, $29,000,000; oats, $22,000,000; tobacco, $18,000,000; potatoes, $15,000,000.

There were substantial gains in value of dairy and poultry products

and of animals sold and slaughtered. The price of butter has not been so high in many years, and the same is true for eggs and dressed poultry, and, except for the higher price of last year, is also true for milk.

In the grand total, the farm products of 1909 are greater in value than those of 1908 by $869,000,000, or by enough to buy a new equipment of farm machinery for over 6,000,000 farms.

All cereal crops of 1909 are worth $3,000,000,000 to the farmer, an amount that would pay for all the machinery, tools and implements of the entire manufacturing industry in this country.

All crops are worth $5,700,000,000, which would make a half payment on the value of all steam railroads, according to valuation of 1904. All animal products are worth over $3,000,000,000.

The total of all items is $8,760,000,000.

In eleven years of application of mind, muscle and machine to this basic industry of mankind, the wealth produced by farmers, estimated as previously described, is valued at $70,000,000,000.

Foreign Trade in Agricultural Products.

The value of the agricultural exports of domestic products for the year ending June 30, 1909, has been exceeded in four years—in 1901, 1906, 1907 and 1908. The value for 1909 is $903,000,000, or $151,000,000 below the highest record in 1907, and $114,000,000 below the next highest in 1908.

Compared with 1908, the prominent decreases were $11,500,000 for live animals, $26,000,000 for packing house products, $20,000,000 for cotton, $55,000,000 for grain and grain products, and $3,800,000 for tobacco. On the other hand, there was an increase of over $7,000,000 in exports of oil cake, oil-cake meal and vegetable oils.

The domestic exports of beef and beef products declined from 579,000,000 pounds in 1908 to 419,000,000 pounds in 1909; of pork and pork products, from 1,237,000,000 to 1,053,000,000 pounds; of wheat, from 100,000,000 to 67,000,000 bushels; of wheat flour, from 14,000,000 to 10,500,000 barrels; of wheat and wheat flour in terms of wheat, from 163,000,000 in 1908 to 114,000,000 bushels in 1909.

The imports of agricultural products were never so high in value as they were in 1909, the amount being $637,000,000. Principal gains were $15,000,000 in silk, $21,500,000 in wool, $25,600,000 in packing house products, mostly hides, $11,400,000 in coffee, and $16,500,000 in sugar.

After allowing for the $10,000,000 in exports of foreign origin, the net balance of foreign trade in agricultural products in favor of this country is $256,000,000, the lowest amount since 1896. This was more because of increased imports than of decreased domestic exports. The balance of trade in favor of this country in products other than agricultural for 1909 is $46,000,000.

In foreign trade in forest products the exports of domestic origin were valued at $72,000,000, an amount that has not been exceeded in only three years; compared with 1908, there wass a loss in all prominent items.

The imports of forest products had a value of $124,000,000 and were never before so large in value. India rubber gained $25,000,000, compared

with 1908. With respect to the balance of trade in forest products, it was against this country by about $47,000,000.

The agricultural production of 1909 must add much to the prosperity of farmers. The record is unexampled in wealth produced and tells of abundance in quantity. Year by year the farmer is better and better prepared to provide the capital and make the expenditures needed to improve his agriculture and to educate his children for farm life and work.

MONTANA'S AGRICULTURAL STATISTICS.

First Preliminary Comparative Statement of General Farm Data Issued by the Census Bureau.

Washington, D. C., February 25, 1911.—Census Director Durand issued today the first official statement from the Census Bureau relative to the agricultural statistics of the state of Montana collected at the Thirteenth Decennial United States Census, April 15, 1910.

It is based on a preliminary comparative summary submitted to the Director by Dr. Le Grand Powers, chief statistician of the division of agriculture in the Bureau of the Census. This summary shows, for both the census of 1910 and that of 1900, the reported total value of farm land, buildings, implements, and machinery; total acreage; improved acreage; average acres per farm; average value per acre of farm land and buildings; average value per acre of farm land alone; and the aggregate expenditures for labor and fertilizers. It also distributes the total number of farms according to color of farmer; specified character of tenure; whether held free or mortgaged by owners, and by certain acreage groups.

The Director gives notice that the summary's figures are subject to revision later, owing to the fact that a number of farms whose returns are incomplete will be included in the final tables. These additions will not, in all probability, modify any of the amounts or rates contained in the present statement.

The Crow Indian Land.

It is also explained in the summary that the figures include an area of 3,500,000 acres in the Crow Indian Reservation, which in 1900 was occupied for grazing purposes by a corporation that had leased the land from the Indians. No such lease existed in 1910, although at the time the census was taken only a small portion of the reservation was used for agricultural pursuits. For purposes of comparison, totals for 1900 are given, inclusive and exclusive of this land.

The census of agriculture was taken primarily for the purpose of obtaining an accurate inventory of all classes of farm property existing on April 15, 1910; a complete exhibit of farm operations during the year ended December 31, 1909; and a statement of the number and value of domestic animals in cities and villages on April 15, 1910.

Statements relative to the acreage and yield of crops and the domestic animals of Montana will be issued by Director Durand as soon as the tabulation of this data has been completed.

The Per Cent of Increase and Decrease.

It is pointed out in the statement today that the principal rates of increase in Montana in 1910, as against 1900, are: In the total value of all farm land alone, 394 per cent; in the total value of farm land and buildings ,355 per cent; in the average value per acre of farm land alone, 205 per cent; in the total value of all farm implements and machinery, 187 per cent; in the average value per acre of farm land and buildings, 182 per cent; in the total value of farm buildings alone, 164 per cent; in the total expenditures for fertilizers, 150 per cent; in the total expenditures for labor, 114 per cent; in the total improved farm acreage, 110 per cent; in the whole number of farms, 94 per cent; and in the total farm acreage, 62 per cent.

The only decrease during the decade occurred in the average acres per farm, 17 per cent.

The statement shows in detail that the number of farms reported in 1910 was 25,946, as compared with 13,370 in 1900, an increase of 12,576, or 94 per cent.

The total value of farm land and buildings was given in 1910 as $250,845,000, as against $55,026,000 in 1900, an increase of $195,459,000, or 355 per cent.

Farm Land Values.

The total value of all farm land alone was reported in 1910 as $225,819,000, as compared with $45,686,000 in 1900, a gain of $180,133,000, or 394 per cent.

The total value of all farm buildings alone was given in 1910 as $24,666,000, as against $9,340,000 in 1900, an increase of $15,326,000, or 164 per cent.

In 1910 the value of the farm land alone constituted 90 per cent of the total value of land and buildings, as compared with 83 per cent in 1900.

The reported value of farm implements and machinery was $10,522,000 in 1910, as against $3,672,000 in 1900, a gain of $6,850,000, or 187 per cent.

The total acreage reported in 1910 was 13,499,000 acres, as compared with 8,344,000 in 1900, an increase of 5,155,000 acres, or 62 per cent.

The improved acreage was returned in 1910 as amounting to 3,631,000 acres, as against 1,726,000 in 1900, an increase of 1,905,000 acres, or 110 per cent.

The improved acreage formed 27 per cent of the total acreage in 1910 and 21 per cent in 190.

The average acres per farm reported in 1910 was 520, as against 624 in 1900, a decrease of 104 acres, or 17 per cent.

The average value per acre of farm land and buildings in 1910 is stated as $18.56, as against $6.59 in 1900, a rise of $11.97, or 182 per cent.

The average value per acre of farm land alone in 1910 was reported as $16.73, while in 1900 it was $5.48, the amount of gain being $11.25, or 205 per cent.

Farm Ownership.

Of the whole number, 25,946, of farms reported in 1910 there were 24,752, or 95 per cent, operated by white farmers and 1,194, or 5 per cent, by colored, as compared with a total of 13,370 in 1900, of which 13,042, or 98 per cent, were conducted by white farmers and 328, or 2 per cent, by colored. The increase in the number of farms of white farmers during the decade amounted to 11,710, and in the number of farms of colored farmers to 866.

The total number of farms operated in 1910 by owners, part owners, and owners and tenants, comprising the "all owners" class, was 23,125, as compared with 11,661 in 1900, an increase of 11,464.

The total number of farms conducted in 1910 by cash tenants, share tenants and cash and share tenants, comprising the "all tenants" class, was 2,323, as against 1,230 in 1900, an increase of 1,093.

The total number of farms operated by managers in 1910 was 498 as compared with 479 in 1900, an increase of 19.

The total number of farms operated by the "all owners" class constituted 89 per cent of the whole number of farms in 1910, and 87 per cent in 1900; those operated by the "all tenants" class, 9 per cent in both 1910 and 1900; and those conducted by managers, 2 per cent in 1910 and 4 per cent in 1900.

Of the total number, 23,125, of farms operated in 1910 by the "all owners" class, there were 4,794, or 21 per cent, reported as mortgaged while 18,331, or 79 per cent, were reported as "owned free of debt." There were 499 farms for which no mortgage report was secured, and these are included in the farms free from debt.

In 1900 information was secured concerning the "owned farm homes." At that time 1,608, or 13 per cent, were reported as mortgaged, while 10,356, or 87 per cent, were free from debt. There were 498 in 1900 for which no mortgage report was secured, which were included in the farms free from debt. The Census Bureau has no information respecting the number of mortgaged farms leased to tenants.

Distribution According to Acreage Groups.

The statement relative to farms distributed according to certain acreage groups shows that those of 19 acres and under numbered 724 in 1910 and 653 in 1900, a gain of 71; of 20 to 49 acres, 939 in 1910 and 399 in 1900, an increase of 540; of 50 to 99 acres, 1,247 in 1910 and 563 in 1900, an increase of 684; of 100 to 174 acres, 10,394 in 1910 and 5,613 in 1900, an increase of 4,781; of 175 to 499 acres, 8,299 in 1910 and 3,596 in 1900, an increase of 4,703; of 500 to 999 acres, 2,347 in 1910 and 1,257 in 1900, an increase of 1,090; and of 1,000 acres and over, 1,996 in 1910 and 1,289 in 1900, a gain of 707.

Acreage Group Proportions.

Of the whole number of farms, those of 19 acres and under formed 3 per cent in 1910 and 5 per cent in 1900; those of 20 to 49 acres, 4 per cent in 1910 and 3 per cent in 1900; those of 50 to 99 acres, 5 per cent in 1910 and 4 per cent in 1900; those of 100 to 174 acres, 40 per cent

in 1910 and 42 per cent in 1900; those of 175 to 499 acres, 32 per cent in 1910 and 27 per cent in 1900; those of 500 to 999 acres, 9 per cent in both 1910 and 1900; and those of 1,000 acres and over, 7 per cent in 1910 and 10 per cent in 1900.

The expenditures for labor in 1910 reached the sum of $10,874,000 as compared with $5,077,000 in 1900, an increase of $5,797,000, or 114 per cent.

The expenditure for fertilizers amounted in 1910 to $10,000 while in 1900 it was $4,000, a gain of $6,000 or 150 per cent.

Summary for the State.

The preliminary comparative summary follows:

ALL FARMS BY ACREAGE, VALUE OF LAND, BUILDINGS, IMPLEMENTS, ETC.

	1910	1900	Per cent of Increase, 1900–1910.
All farms	25,946	13,370	94
Total acreage	13,499,000	*11,844,000 †8,344,000	62
Improved acreage	3,631,000	*1,737,000 †1,726,000	110
Average acres per farm	520	†624	‡17
Value of land and buildings	$250,485,000	*$62,026,000 †$55,026,000	355
Value of land	$225,819,000	*$52,661,000 †$45,686,000	394
Value of buildings	$24,666,000	*$9,365,000 †$9,340,000	164
Value of Implements and machinery	$10,522,000	$3,672,000	187
Average value per acre of land and buildings	$18.56	†$3.59	182
Average value per acre of land alone	$16.73	†$5.48	205
Expenditures for—			
Labor	$10,874,000	$5,077,000	114
Fertilizers	$10,000	$4,000	150

* Includes land on Indian reservation in Rosebud and Yellowstone counties.
† Exclusive of land on Indian reservation in Rosebud and Yellowstone counties.
‡ Decrease.

ALL FARMS BY COLOR OF FARMER. TENURE, ACREAGE, GROUPS, ETC.

		1910	1900	Amount of Increase, 100–1910.
All farms by color of farmer	.....	25,946	13,370	12,576
Negro and other non-white farmers (A)	.....	1,194	328	866
White farmers	.....	24,752	13,042	11,710
All farms by tenure	.....	25,946	13,370	12,576
All owners	.....	23,125	11,661	11,464
Owners free	.....	18,331	.....	.....
Owners mortgaged	.....	4,794	.....	.....
All tenants	.....	2,323	1,230	1,093
Managers	.....	498	479	19
Distribution by acreage groups	.....	25,946	13,370	12,576
19 acres and under	.....	724	653	71
20 to 49 acres	.....	939	399	540
50 to 99 acres	.....	1,247	563	684
100 to 174 acres	.....	10,394	5,613	4,781
175 to 499 acres	.....	8,299	3,596	4,703
500 to 999 acres	.....	2,347	1,257	1,090
1,000 acres and over	.....	1,996	1,289	707

(A) In Montana by non-white farmers Indians are meant, negroes not being numerous enough to be a factor.—(Note by Commissioner of Bureau of Agriculture, Labor and Industry).

ELECTRIC POWER.

The hydro-electric development in Montana ranks with that of any like area in the world and far surpasses most of the states of the union and of the territories. Hydro-electric power means electricity derived from impounded, or dammed up waters. The fact has long been recognized that the different forces of nature are dynamic, or interchangeable. Light, heat, rotary motion may, by the introduction of mechanical devices, be changed in their nature to the extent that one takes the place of the other. And the same thing is true of falling water. A swiftly flowing river represents power, but it required the ingenuity of man to turn such power to account and make it amenable to control and to divert it to the use of mankind. Michael Faraday was the first man to apply an electric current to a magnet in such a way as to produce practical results in mechanics to make possible the utilization of the vast water power of the world.

It is true that water power was used in a primative way long before the time of Faraday. By means of water wheels mills were made to run. Flour and corn were ground, trees were sawed into boards, and other mechanical devices were operated, but it was not until after the experiments of Volta, Olmstead, Faraday and Sir Humphrey Davy that the possibilities of electricity began to be recognized, and it was long after their labors were ended that electric science developed and became an almost indispensable aid to humanity. The sun's rays evaporate the waters of the seas lakes and rivers, and these ascending to the skies, condense and fall in rain, making rivers, and water falling over precipitous brinks cause the water falls which are a great source of electric power.

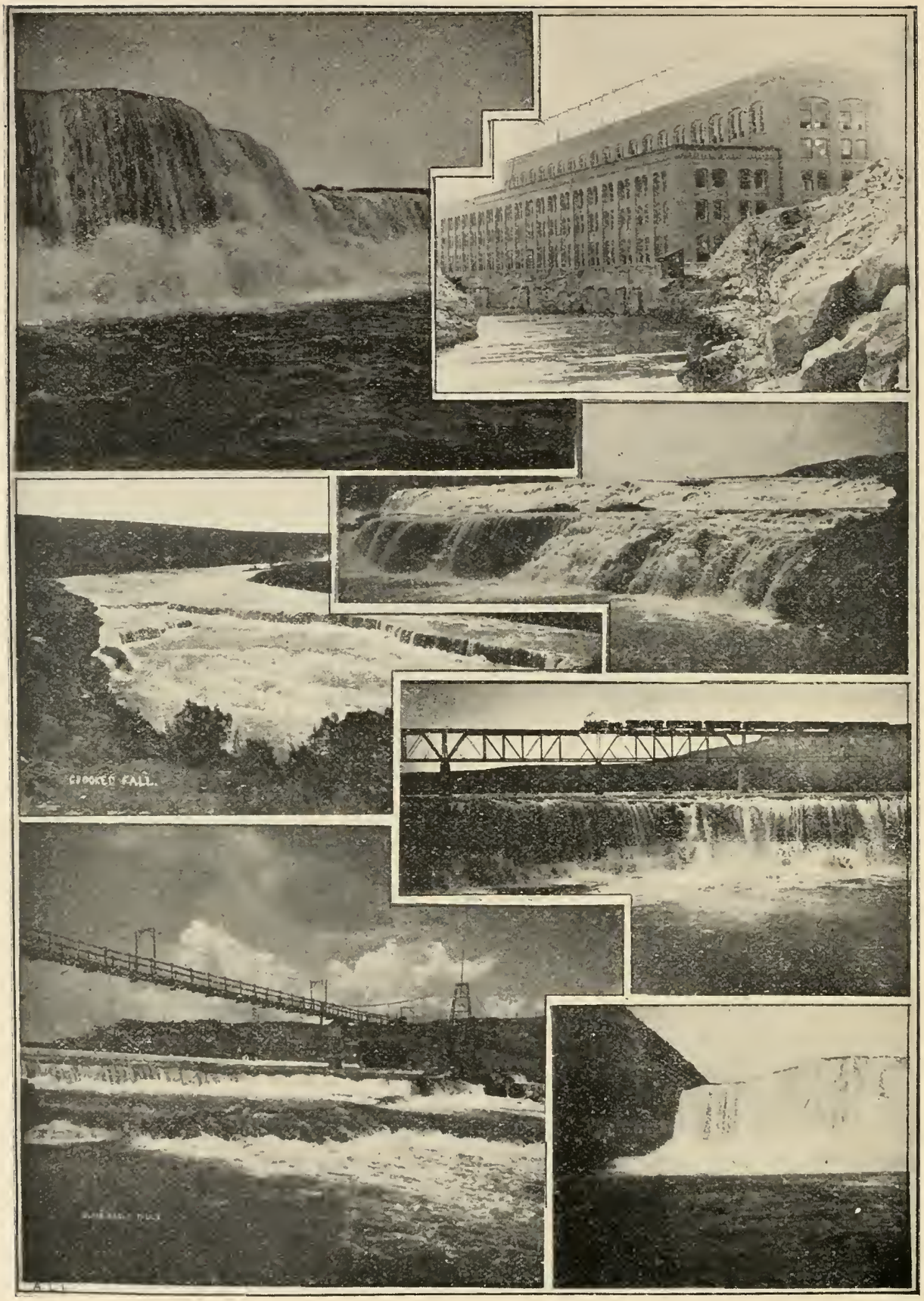
Montana is especially fortunate in having one of the greatest sources of this power by reason of the many rapid flowing streams that traverse the state. The Missouri river and its tributaries constitute the main source of this power, although the western slope, where are situated the sources of the Columbia river, also has a potentiality in undeveloped or partially developed electric power, that will add greatly to the voltage now in use when once harnessed anl put to work.

Development of Electric Power in the Great Falls District.

The companies that have installed plants at Great Falls have developed and in process of development water power to the amount of 144,000 horse-power and there is a possibility of adding largely to this as other sites are available for power development.

The Great Falls Electric Properties has a dam on Black Eagle Falls that operates under 40 feet of head and has 1,800 horsepower of water wheels installed. It supplies light for the city of Great Falls and power for the street railway.

The Boston & Montana Copper company have a development on the Black Eagle falls under 40 feet of head with 9,500 horse-power of water wheels installed and the Great Falls Power Company have 980 horse-power developed at these falls also. The power development is used in the operation of the Boston and Montana smelter at Great Falls.



Water Power at Great Falls.

The Great Falls Power Company has a development on Rainbow Falls, about three miles from the city of Great Falls. This development has 107 feet of head and 40,000 horse-power of water wheels. The power developed is usd in the Boston and Montana smelter and will also be transmitted for the operation of mines and for other purposes. The company has in process of development a water power on the Big Falls, about six miles from the city of Great Falls. This development will be under 105 feet of head and will have 30,000 horse-power of water wheels. The power will be used for the operation of mines and smelters in and about Great Falls and will also be transmitted to other districts.

Madison River Power Co.

One of the greatest sources of electric power in Montana is the Madison River, a tributary of the Missouri river. It has its source in the Yellowstone National Park and is a strong turbulent stream, of rapid descent, thus rendering it peculiarly suitable for the development of electric power. Its availability for the purpose was early recognized and as the demand for this class of power was constantly on the increase, especially in the operation of mines and smelters, a company was formed and the most available sites appropriated. Two sites were selected at which to construct dams, near the town of Norris, in Madison county. They are owned by the Madison River Power Company. The smaller of the two plants is under 60 feet head and has 3,000 horse-power installed. The larger development is under 112 feet of head and has 12,000 horse-power of water wheels installed. The power from thes plants is transmittd to Butte and also to Bozeman and Livingston. At the Conrey placers, at the mouth of Alder gulch, where several large dredges are operated, the power comes from the Madison river. Lately a survey has been made for an electric railway line from Alder, the terminus of the Northrn Pacific branch line in the Ruby valley, to Virginia City, the former capital of Montana in territorial days. The expectation is that this line will be completed this summer and will be operated by electric power from the Madison river.

An interurban line of railway has been constructed from Bozeman to Three Forks, or the head of the Missouri river. The power operating this line is derived from the Madison River Power Company. In addition to this utilization of the power from the Madison river, there is every probability that the gold mines at the head of Alder gulch will also make a demand for electricity to use in operating the mines. Such a conclusion is reasonable from the fact that the expense in transporting coal is too great to admit of its use, while electricity is not only cheap, but readily available. With the completion of the trolley line up Alder gulch and the installation of electric power at the mines great expectations are entertained for the revival of activity in the old camp. Electricity is the powerful medium that is doing more than anything else in transforming and rejuvenating more than one section of Montana and Madison county is going to profit along with other sections.

In addition to the above high tension transmission line has been

extended from Livingston to Billings, via Big Timber and Columbus, the distance from the Madison River plant to Billings being 177 miles. This line is supplying the towns of Livingston, Hunters Hot Springs, Big Timber, Columbus and Laurel. Power will be taken from the same for pumping water on large tracts of land for irrigating purposes. The high tension lines from this system now cover a distance of 441 miles.

The United Missouri River Power Co.

The company now has two immense dams and generating stations on the Missouri River 15 miles from Helena, and it is building a third with a capacity greater than the combined capacities of the present dams making a total of about 100,000 horse power from the three plants.

The three dams will develop a total head of 220 feet, and impound three storage reservoirs extending over 60 miles along the Missouri River, and having a total area of 20 square miles.

The water supply for these three plants comes from 16,000 square miles of drainage area in the heart of the Rocky Mountains.

The Canyon Ferry generating station has been in operation since the autumn of 1908. At that time the plant had a capacity of 4,000 horse power; in 1902 it was increased to 10,000 horse power, and a duplicate transmission line was built from Canyon Ferry to Butte consisting of two pole lines 40 feet apart and on each line are three copper cables each haivng seven strands.

These lines are spaced in a triangle six feet apart and were operated at 60,000 volts.

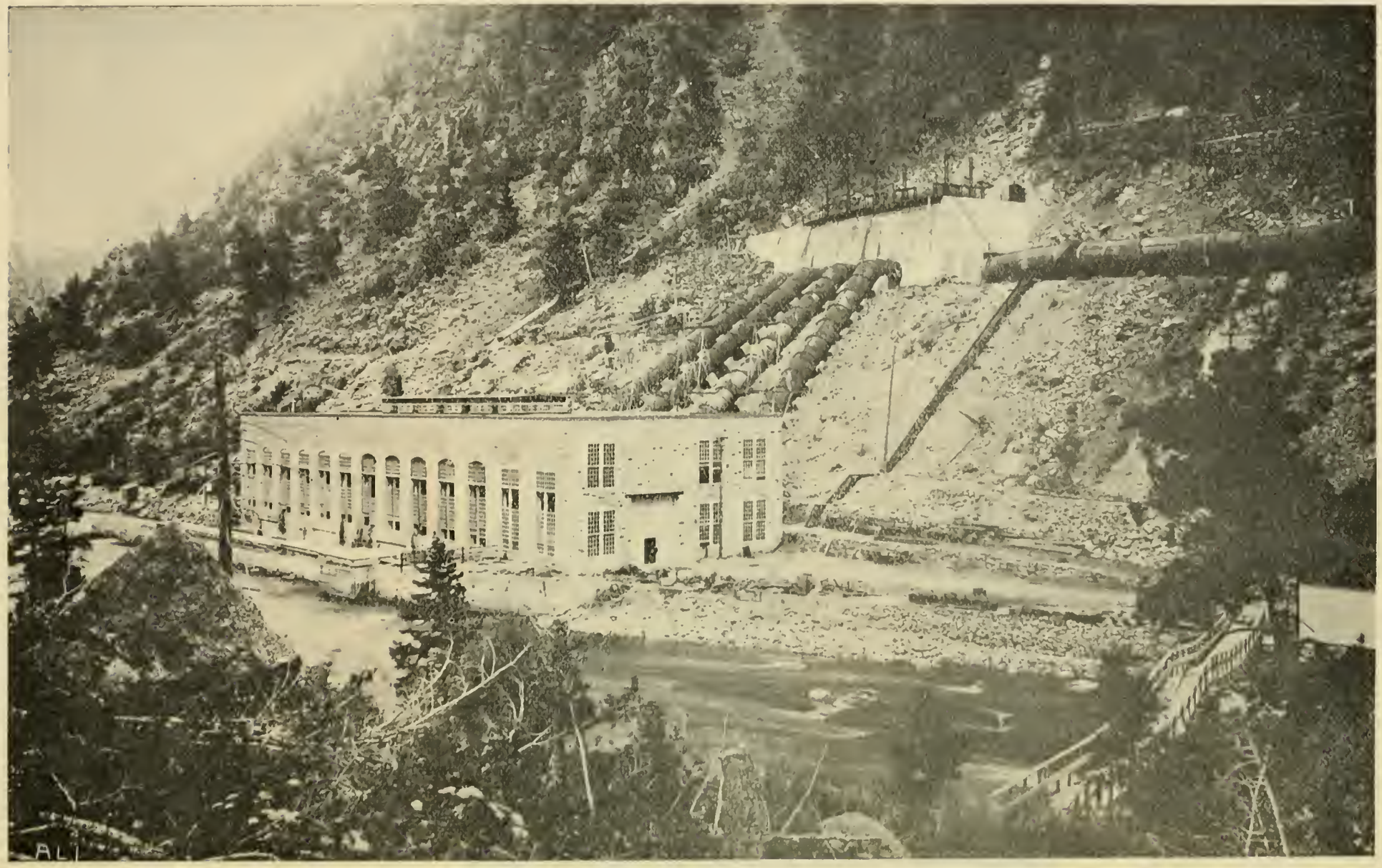
In 1906 the voltage was increased to 70,000 and the lines were extended to the Washoe smelter at Anaconda and the sub-station in Butte was replaced by an up-to-date sub-station of 15,000 horse power capacity. The power house is built of granite. The water wheel equipment is the S. Morgan Smith type. There are ten 1,000 horse power turbines direct-connected to the ten generators of 750 kilowatts each. Also three smaller wheels direct-connected to exciters.

The electrical equipment was made by the Westinghouse Electrical and Machinery Company of Pittsburg, and consists of ten 1,000 kilowatt generators; two 90 kilowatt exciters, and one 115 kilowatt exciter. The power is sent to Butte, Anaconda and East Helena.

The Hauser Lake plant was in operation from February 12, 1907 to April 14, 1908 when the dam was washed out; but the power house was not seriously injured and fortunately no lives were lost.

The work of ocrenstruction was begun in July 1908 and the work will be pushed until the dam is completed. The reservoir will extend up the river to the Canyon Ferry dam and up Prickly Pear to within eight miles of Helena.

The third dam is being built at Holter and will develop 60,000 horse power. The reservoir will extend up the river to the Hauser Lake dam. About five hundred men are employed in the construction and the plant will be completed in less than two years.



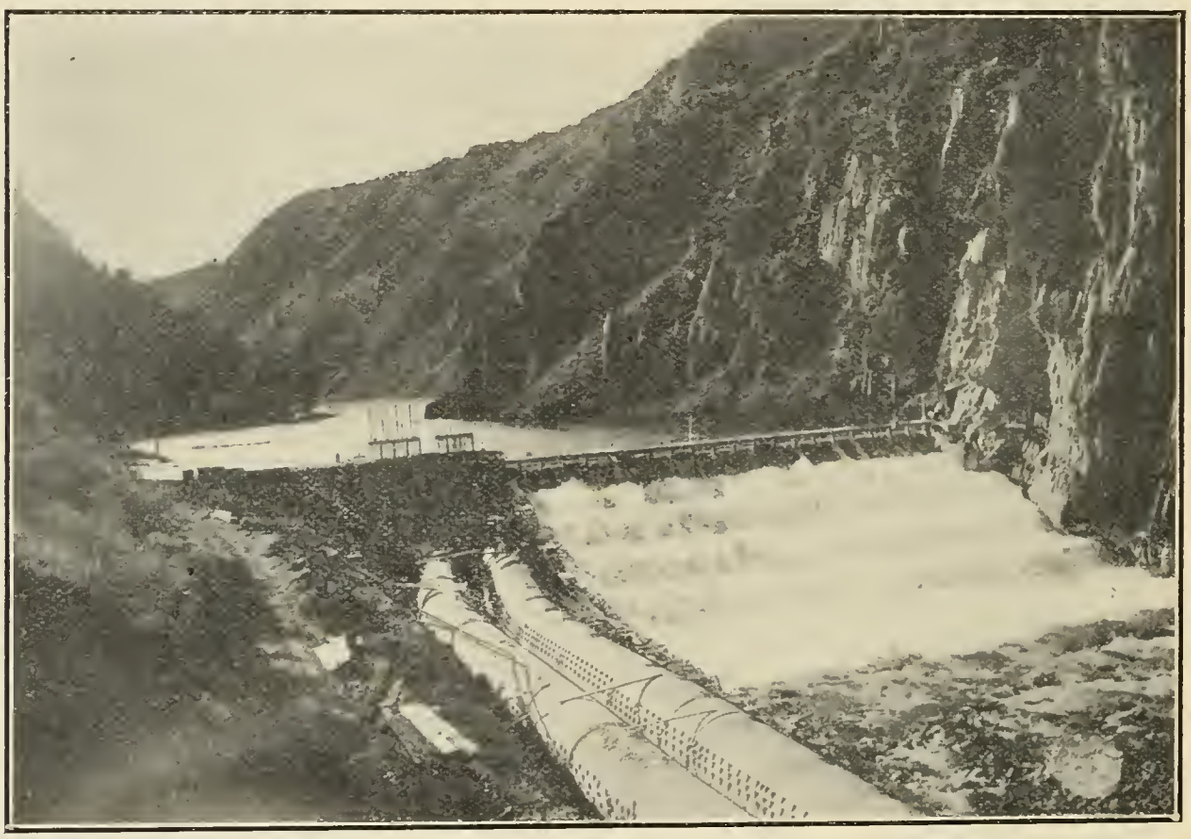
Madison River Power House.

Big Hole River Power Plant.

In the southern part of the state is situated the Big Hole River, a tributary of the Missouri river. It empties into the Jefferson river and the latter runs into the Missouri River at Three Forks. On the Big Hole river the Montana Power Transmission company has a plant under 60 feet of head about four miles from Divide station. The plant has installed 4,000 horse-power of water wheels. All of the power generated at this plant is transmitted to the big mining camp of Butte.

Jefferson River Plant.

On the Jefferson river near Parrot station, is situated the Parrot Power Plnant. It is owned and operated by the Butte Electric and Power company, has an 80 foot head and 1,000 horse-power of water wheels installed. The power is transmitted to Butte for use in the mines and for running mining machinery.



Madison River Power Company's Dam.

Yellowstone Electric Power District.

The Yellowstone river, which is also a tributary of the Missouri river, and the largest of the kind, having its source in the Yellowstone National Park, has been pre-empted for two hydro-electric plants. The Butte Electric and Power company was the first to enter the field in the Yellowstone region and has two plants under operation. One of these is at Livingston operating under 24 feet of head with 1,000 horse-power wheels installed. The power is used in Livingston and surrounding country.

The second plant, operated by the same company, is at Billings. The plan operates under 20 feet of head and 2,900 horse-power of wheels installed. The power is used in Billings and surrounding country.

Missoula Electric Power District.

The largest electric power plant in in western Montana is on the Missoula river, near Bonner. The Missoula river is a tributary of the Columbia river which empties into the Pacific ocean. The power plant was installed by the Missoula Light and Power company under a 25-foot head and 4,000 horse-power of water wheels installed. The power from this plant is transmitted to Missoula, a distance of about six miles, where it is used for operating lights and the street railway systems of the city.

Kalispell Electric District.

The Flathead Valley Water Power Company has a water power plant of about 1,000 horse-power of water wheels. This power is used in Kalispell and the surrounding country.

Lewistown Electric District.

There are two water power plants near Lewistown, Montana. The largest of these plants operates under 65 feet of head and has installed 650 horse-power of water wheels.. These plants are being reorganized by S. W. Gebo, of Lewistown. They furnish power for lights, etc., for the city of Lewistown.

Power From Big Blackfoot.

On Lander's Fork of the Big Blackfoot, in Powell county, a dam has been constructed and electric power is transmitted to the mining camp of Gould, 20 miles north of Helena. The power is to be used in mining operations and for lights.

Clark's Power Dam, Missoula.

PORTLAND CEMENT PRODUCTION.

The total production of Portland Cement in the United States in 1909 as reported by the Geological Survey was 62,508,461 barrels, valued at $50,510,385. As compared with the production of 1908, which was 51,072,612 barrels, valued at $43,547,679, the output for 1909 represents an increase as reported by the Geological Survey was 62,508,461 barrels, valued at in quantity of 11,435,849 barrels, or 22.37 per cent, and an increase in value of $6,962,706, or 15.96 per cent.

Trident, Gallatin County, Montana, on the Northern Pacific Railway, has a population of 250. The town is situated on the east bank of the river just below the point where the Missouri is formed by the union of the Gallatin, Madison and Jefferson Rivers. It has a water system, electric lights, 1 school building, 1 hotel and 1 general store.

In the last year about $1,500,000 has been spent on improvement, by far the most important being the large plant of the Three-Forks Portland Cement Co., which has been in operation only a few months.

The crusher house is located at the base of the foothills which consist of an immense deposit of high grade cement stone. A railroad has been constructed along the quarry and a locomotive hauls the cars from the workings to the mill. The material is broken down with dynamite and loaded with a steam shovel on ore cars, which automatically deposit their freight in the chute above the number nine crusher. The product is of a superior quality and after being set under water shows a tensile strength varying from 600 to 900 lbs.

The company employs 130 men and have a payroll of $12,000 per month.

This is the beginning of a new industry and is of unusual importance to the State.

Through the courtesy of the Superintendent, Mr. C. S. Fisher, the Bureau has secured the following description of the plant equipment.

It has two gyratory crushers; one No. 5 and one No. 9. The No. 9 crusher is capable of handling rock up to 24 inches in diameter. The rock comes from the No. 9 crusher and the coarser particles are passed through the No. 5, so that it will all pass inch and a half ring, before it is put in the blending bins. From the crusher house, material goes to a sampling mill, where a sample of all material going into all of the bins is taken. From this sample analysis is made; and from the analysis the chemist figures proportion in which the rocks are to be mixed. After the rocks have been sampled, it is stored in large bins from which it is drawn on a belt conveyor and weighed in the proper proportions. It is then taken to the dryer, where all the moisture is taken out. The dryer is a tube 9 feet in diameter and 90 feet in length, placed in a horizontal position on idlers with a slope of one half inch to the foot. The rock is brought in at the upper end of this tube and a producer gas is blown in at the lower end. The tube is revolved at a rate of 3 times per minute, which causes the rock to roll slowly towards the lower end and out.

When the rock comes from dryer, it is elevated up into the mill

building and runs into bins from which it is taken into the comminutors and tube mills. The mill has four comminutors and four tube mills. Two of these comminutors and two cube mills are used for grinding the raw material, and two each are used for grinding the finished product. From the tube mills the raw material comes in the form of a fine powder, 88 per cent of which will pass a 100 mesh screen. This material is conveyed over the run into the rotary kilns, which are nine and one half feet in diameter at the lower end and nine feet in diameter at the upper end and are 140 feet long. These cylinders ar also placd in a horizontal position with an incline of one half inch to the foot away from the feed end. Their speed revolution is approximately three times per minute. A powdered coal which has previously been dried in a Cummer's Coal Dryer and ground in a Fuller grinding mill to a fine powder is blown into the kilns at the lower end with a blast of air, part of which is taken from the hot clinker. This coal ignites instantly upon entering the furnace and burns with a flame similar to that of gas and raises the interior of the kiln to a temperature varying between 1800 to 2000 degrees Fahr. This fuses the raw material into a blackish clinker. This clinker is taken from the kiln and cooled by being passed through a cylinder which is 8 feet in diameter and 60 feet long. This cooler is also placed in a horizontal position with a slope of one half inch to the foot away from the feed end and revolves slowly. A draft is generated through this cooler by means of a stack, which carries off the heated gasses and brings the clinker to the atmospheric temperature.

From the cooler the clinker is taken back to the mill building, where it is reground in the comminutors and tube mills which reduces same to a very fine powder. This finished product is cement. The cement is carried to bins and storred, ready for shipment. The capacity of the mill is 1500 barrels per day.

MINING INDUSTRY IN MONTANA.

(Courtesy of William Walsh, State Mine Inspector.)

A comparison of the mining industry throughout the State during the last two years exhibits a slight decrease in the number of men employed. The number of mines is apparently the same but operations are not as extensive as in recent years. Better methods have been employed in the recovery of values in the various ores in mining, milling, smelting, cyaniding and the combination of these and other processes which are being applied to the recovery of values contained in the ores of this state. The results of the improvements in this direction are of incalculable benefit to the chief industry of our state and as a result several old mines, after a long period of inactivity, have again resumed operation, and are yielding handsome profits from a class of ores that were worthless to their early operators. At the time gold, silver, lead and copper were discovered but little had been done in the way of their development other than the securing of gold from the placer deposits and the most superficial prospecting of quartz leads. Much was hoped for in those early days, but the most sanguine never dreamt of such accomplishments as the period since that

time has witnessed. The growth of the mineral industry has been little short of fabulous and while the achievements have been truly marvelous the industry is only yet in its infancy. Each succeeding year not only reveals new deposits of marketable minerals but with it also comes improved methods for the mining of the treasure from the earth that increase the former products and so cheapen them as to permit of competition with the most favored of other countries of the world.

Already our copper has dominated the foreign markets and the keen-sighted capitalist in the possession of wonderful properties is coming here to take part in the great task of mining and manufacturing so as to be upon an equal footing with the enterprising and vigorous American.

No other state has made such rapid strides in the production of copper. Twenty-five years is indeed a brief period compared with the efforts of other copper districts, but it has been long enough to make the name of Montana famous in all lands and one that must redound to future growth and even more rapid development. Few residents of Montana however, have anything like a proper conception of the greatness of their own state from a mineralogical point of view; even those who live among the mines would be surprised at the volume of business annually done. They see the train loads of ore going out day after day but pay little heed to them. They see the corded piles of copper plate and pig being loaded for transportation to market, but they seldom stop to consider the hazardous occupation of the miners who produce this enormous tonnage.

In the mining industry Montana gives employment to a large army of men while in the industries associated with the transporting of the product to the market thousands of people are employed. The capital invested in the industry is enormous. It is not an easy matter to correctly estimate it because of the many changes constantly taking place. The rapid growth of the great mining industry demonstrates the enterprise and energy of those whose capital and vigorous efforts have in such short time placed Montana in the front rank of mineral producing districts of the world.

While Montana has not the deepest shafts it has the richest ore and the greatest abundance and its mines, mills and smelters are equipped with the most modern machinery and every mechanical device and economy that native or foreign ingenuity can conceive.

Advance statistics of metal production in Montana, prepared by V. C. Heikes, are announced by the United States Geological Survey.

Whether Montana shall hold its enviable record of being first on the list of copper and silver producers depends much on the yield of the copper mines at Butte. The State headed the copper list in 1909, but is second to Arizona in 1910, although it remains first in the output of silver. The mines of Montana produce approximately 286,000,000 pounds of copper in 1910, a decrease from the yield of 1909, which was 312,056,538 pounds. The average monthly production of copper, which in 1909 was about 25,600,00 pounds, was reduced to about 23,000,000 pounds monthly during the latter part of 1910. However, according to a statement issued by the management of the largest interest, the new work and development

in the mines will be vigorously carried on and the milling and smelting works at Great Falls and Anaconda will be worked to their full capacity. It is evidently the intention to treat lower grade ores.

Decrease in Silver Output.

The production of silver in Montana in 1910 was affected by the decreased yield of copper, the ores of which usually produce over nine-tenths of the State's total silver output. The remainder of the silver was derived from siliceous ores mined in greatest quantities in Jefferson and Granite counties. Neither of these in 1910 held to their usual production of silver.

Smaller Gold Output.

The gold output derived from copper ores also decreased and to a small extent that derived from siliceous ores mined in Chouteau and Fergus counties. However, this decrease of gold was offset by the increased shipments to the smelters of siliceous ores from near Georgetown, in Deer Lodge County, and the gold-bearing iron sulphides from mines at Radersburg, in Broadwater County. Gold is present in small amounts in the zinc and lead ores, and it is reasonable to suppose that the increase in production of those ores in 1910 added greatly to the total.

The placer industry was in about the same condition in 1910 as in 1909, the production each year aggregating about 26,000 fine ounces of gold. Eighty-five per cent of the placer gold output is produced by the dredges operating in Madison and Missoula counties. Gold production may be expected to increase in 1911 from Madison County placers, as a new and larger dredge than any before constructed was added in 1910, making four which will be in operation in Alder Gulch, near Ruby, and there is a prospect that still another will be built. In Missoula County dredging was brought to an end in August, 1910, by forest fires, which destroyed the power house of the company operating its dredge on Cedar Creek. The dredge at Rocker near Butte, was idle. Near Canyon Ferry in Lewis and Clark County, a new dredge of the stacker type, made by a California firm, is to be electrically operated and will be capable of handling 90,000 to 120,000 cubic yards of gravel a month. It will be ready to start early in 1911.

Other Metals.

The output of lead ore increased but very little over that of former years, the lead production aggregating 3,083,430 pounds in 1909 and approximately 3,600,000 pounds in 1910. The yield is confined principally to Jefferson and Lewis and Clark counties, though small quantities are produced in nine other counties.

The zinc produced in 1909, aggregating 12,000,000 pounds, was derived from concentrate and ores shippel. The output in 1910 should greatly exceed that quantity, as the mining of zinc ore attracted more attention in 1910 than in any previous year.

Labor Conditions.

Labor conditions were quiet by the end of February, but beginning in December 1909, the output of the Butte mines was greatly diminished on account of labor troubles and the strike of switchmen on the Northern

Pacific and Great Northern railroads, which shut off the coal supply from a number of the mines and prevented the transportation of ore from the mines to the smelter at Great Falls.

Mint Estimates for 1910.

The Director of the Mint estimates a production of gold valued at $3,465,364 in Montana in 1910 against $3,750,100 in 1909, and an output of 11,519,059 fine ounces of silver in 1910 against 12,034,500 fine ounces in 1909.

COAL PRODUCTION.

Statistics compiled by the U. S. Geological Survey in co-operation with the Bureau of Census show that the total production of coal in Montana in 1909 was 2,553,940 short tons, having a spot value of $5,029,225. In this production the state surpassed all previous records, exceeding the earlier highest output, 2,016,857 short tons, made in 1907, by 537,083 short tons, or 26.6 per cent. Compared with 1908, when the output was 1,920,190 short tons, the production of 1909 showed an increase of 633,750 short tons, or 33 per cent and the value increased in slightly greater proportion, from $3,771,248 to $5,029,225, a gain of $1,257,977, or 33⅓ per cent. The average price per ton was $1.97 in 1909, against $1.96 in 1908. The increase in production was general throughout the state, but the most important factor was in the effect of developments in the Bull Mountain Field, near Billings, in Yellowstone County. Prior to 1909 no commercial production had been reported from that county. The development of the Bull Mountain field began in 1908, following the advent of the Chicago, Milwaukee and Puget Sound Railroad, and in 1909 the field produced nearly 200,000 tons. The older coal-producing districts show large increases in production. Carbon county in which the Red Lodge field is worked, increased its output 121,552 short tons. The Cottonwood Belt district, in Cascade county, gained 143,412 tons, but did not product the amount mined in either 1906 or 1907. Fergus county where the Judith Basin field is worked, showed the largest percentage of gain of the older counties, having increased its production from 90,318 short tons in 1908 to 221,663 tons in 1909—a gain of 131,345 tons, or nearly 150 per cent. Park county increased its production more than 30 per cent—from 106,942 tons to 139,464 tons.

In 1909 there were 81 mining machines used in the coal mines of Montana, and the machine-mined product amounted to 740,686 short tons, or 29 per cent of the total output of the state. These were increases, as compared with 1908, of 22 in number of machines and of 27,469 short tons in the quantity of coal undercut with them. In 1907, 984,368 tons, or 50 per cent of the total, were machine mined. Of the 81 machines in use in 1909, 71 were pick machines, 8 were of the chain-breast type, 1 was a "continuous cutter," or shortwall machine, and 1 was a pick shearing machine. Two of the machines were used in development work and did not add materially to the machine-mined tonnage.

The coal-mining industry in Montana, according to the best records available, began in 1880, the production in that year, according to the

United States census, amounting to 224 short tons. The industry was of no great importance, however, until 1889, when the production increased nearly 800 per cent—from 41,467 short tons in 1888 to 363,301 short tons in 1889. During the next 6 years development advanced rapidly, until in 1895 the coal output of the state exceeded 1,500,000 tons. From 1895 to 1905 the production remained practically steady, ranging from a minimum of 1,358,919 tons in 1904 to a maximum of 1,661,775 tons in 1900. It increased to 1,852,921 tons in 1906, and exceeded 2,000,000 tons for the first time in 1907.

According to the estimates of M. R. Campbell, of the U. S. Geological Survey, the original coal supply of Montana was 303,060,000,000 short tons, from which there had been mined to the close of 1909 approximately 29,300,000 tons, representing an exhaustion, including the waste in mining, of about 44,000,000 tons, or 0.015 per cent of the original supply.

COAL PRODUCTION BY COUNTIES.

COUNTIES.	1909.		1910.	
Carbon	1,098,496	tons	1,197,430	tons
Cascade	996,571	"	929,595	"
Chouteau	22,816	"	22,986	"
Custer	7,355	"	3,350	"
Fergus	245,229	"	303,649	"
Gallatin	7,441	"	29,862	"
Park	117,483	"	101,269	"
Rosebud	551	"	.....	
Valley	1,743	"	4,018	"
Yellowstone	43,994	"	378,087	"
Total	2,541,679	tons	2,970,246	tons

In 1890 the production of coal, in Montana, reached according to the figures gathered by the U. S. Geological Survey, for the first time, the half million mark.

The figures gathered by them are as follows:

YEAR.	Number of Men Employed.	Tonnage, (Short Tons.)
1890	1,251	517,477
1891	1,119	541,861
1892	1,158	564,648
1893	1,401	892,309
1894	1,782	927,395
1895	2,184	1,564,108
1896	2,335	1,543,445
1897	2,337	1,647,882
1898	2,359	1,497,803
1899	2,378	1,496,451
1900	2,376	1,661,775
1901	2,158	1,442,569
1902	1,938	1,502,115
1903	2,418	1,514,538
1904	1,813	1,471,504
1905	2,289	1,743,771
1906	2,309	1,502,200
1907	3,229	2,030,564
1908	3,642	1,978,347
1909	3,862	2,541,679
1910	4,117	2,970,246

The first 10 months of 1906 production of coal ends Oct. 31, 1906.
The 1907 period ends Oct. 31, 1907.
The 1908 period ends Oct. 31, 1908.
The 1909 period ends Oct. 31, 1909.
The 1910 period ends Oct. 31, 1910.

THE PUBLIC SCHOOLS.

STATE BOARD OF EDUCATION, EX-OFFICIO.

Governor Edwin L. Norris ..... President
Albert J. Galen ..... Attorney General
W. E. Harmon ..... State Superintendent, Secretary

APPOINTED.

C. H. Hall ..... Missoula
N. R. Leonard ..... Butte
O. W. McConnell ..... Helena
Roy E. Ayres ..... Lewistown
O. P. Chisholm ..... Bozeman
S. D. Largent ..... Great Falls
H. G. Pickett ..... Helena
G. T. Paul ..... Dillon
B. T. Hathaway ..... Clerk of the Board

Education and productive labor are the prime factors in social and industrial progress. Every child in the state is given a favorable opportunity to receive mental and moral training to the extent that money can be expended advantageously for school purposes under present conditions.

According to the United States census reports Montana is a banner state in the lowest per cent of illiteracy and maintains a high standard in popular education.

The state received for public schools, land grants of two sections in every township making a total of more than five million acres, which according to our state laws could not be sold for less than $10.00 per acre. The interest on monies received from the sale of school lands, receipts from rentals and liberal property taxes give to the public schools, a magnificent fund for their support.

The state has 1,188 graded schools, 15 county and 14 city high schools.

The number of children under 21 years reported in 1910 was 126,944.

The Bureau has a card index file giving all the data required by law for every child in the state under 17 years of age according to the school census reports.

PUBLIC SCHOOL STATISTICS FOR THE YEAR ENDING SEPTEMBER 1, 1909.

COUNTIES.	Paid for Buildings and Furniture.	Paid for Incidentals.	Paid for Salaries.	Total.
Beaverhead	$ 2,436.92	$ 8,005.52	$ 23,933.45	$ 35,696.28
Broadwater	765.29	3,787.50	15,665.85	20,806.99
Carbon	6,519.34	8,199.34	41,968.15	57,936.60
Cascade	72,833.66	800.00	114,636.63	190,074.74
Chouteau	27,321.42	11,892.18	50,365.80	92,996.56
Custer	31,439.53	7,825.21	39,807.50	82,177.13
Dawson	16,537.56	5,829.08	29,233.00	54,727.58
Deer Lodge	8,718.61	11,134 31	53,110.95	75,610.66
Fergus	10,676.08	22,070.70	47,748.47	82,907.57
Flathead	55,735.55	17,050.66	53,331.23	128,757.10
Gallatin	33,786.54	12,764.67	52,136.35	100,265.28
Granite	714.79	3,396.05	11,627.65	16,280.32
Jefferson	19,237.19	5,481.56	22,490.76	48,455.22
Lewis and Clark	45,959.74	28,512.86	93,944.71	173,836.29
Lincoln	17,348.75	2,980.29	15,717.25	37,517.55
Madison	2,837.44	10,533.72	34,582.39	48,685.84
Meagher	1,720.25	2,125.16	11,592.75	16,150.78
Missoula	8,797.30	17,734.26	62,050.50	90,692.27
Park	7,779.10	8,343.40	36,102.80	54,273.89
Powell	2,603.66	2,405.32	17,654.20	23,473.91
Ravalli	8,317.08	6,192.97	38,745.25	54,542.53
Rosebud	10,934.37	4,410.87	23,602.64	41,769.90
Sanders	26,924.99	2,687.03	15,985.20	46,786.98
Silver Bow	112,836.42	56,700.95	217,944.00	395,489.71
Sweet Grass	7,837.44	2,539.44	14,723.61	26,013.29
Teton	19,372.27	4,429.97	22,922.40	48,262.64
Valley	9,730.05	9,212.18	28,442.93	49,262.63
Yellowstone	111,893.02	24,064.58	89,954.66	238,097.87
The State	$681,614.39	$301,109.78	$1,280,021.08	$2,331,548.11

PUBLIC SCHOOL STATISTICS FOR THE YEAR ENDING SEPTEMBER 1, 1909.

COUNTY.	Teachers.	Children.	Schools.	Value of Property.	Paid for Libraries.	Paid for Apparatus.
Beaverhead	45	1,489	32	$ 63,405.00	$ 449.30	$ 871.09
Broadwater	29	738	20	21,880.00	148.30	440.05
Carbon	95	3,655	55	147,325.00	482.85	766.92
Cascade	170	6,753	85	444,277.00	638.22	1,166.23
Chouteau	82	2,863	56	195,180.00	1,391.37	2,025.76
Custer	79	2,895	55	87,735.00	1,192.15	1,912.74
Dawson	61	2,054	65	82,765.00	1,018.07	2,109.87
Deer Lodge	55	3,240	22	205,575.00	721.38	1,925.41
Fergus	98	3,518	74	104,590.00	695.03	1,717.29
Flathead	81	4,956	63	52,715.00	1,507.66	1,132.00
Gallatin	95	4,146	59	222,345.00	310.19	1,267.53
Granite	22	816	17	32,900.00	322.88	218.95
Jefferson	39	1,266	23	30,631.00	671.39	574.32
Lewis and Clark	121	5,000	56	517,795.00	928.61	4,490.37
Lincoln	27	756	19	38,510.00	441.00	1,030.26
Madison	72	1,965	31	79,800.00	732.29	.....
Meagher	31	540	44	12,530.00	439.36	273.26
Missoula	103	3,780	49	337,598.28	700.67	1,409.54
Park	76	2,684	53	126,670.00	391.65	1,656.94
Powell	36	1,282	28	42,203.00	19.35	791.38
Ravalli	62	2,949	31	116,785.00	764.05	523.18
Rosebud	48	1,050	31	58,242.00	767.41	2,054.61
Sanders	29	791	21	52,135.00	461.70	728.06
Silver Bow	231	13,488	35	908,830.00	207.59	7,800.75
Sweet Grass	43	1,013	31	49,479.80	155.35	757.45
Teton	39	1,197	26	61,000.50	245.95	1,292.05
Valley	62	2,484	34	112,028.90	1,134.54	742.93
Yellowstone	120	4,219	52	372,547.00	1,094.47	11,091.14
The State	2,051	81,547	1,167	$4,577,477.48	$18,032.78	$50,770.08

PUBLIC SCHOOL STATISTICS FOR THE YEAR ENDING AUGUST 31, 1910.

COUNTIES.	Number School Buildings.	Value of School Buildings and Sites.	Value of School Libraries.	Amount Expended for School Purposes.	Census of School Children.		
					Children between 6 and 21.	Children under 6.	Total.
Beaverhead	31	$ 58,700.00	$ 1,638.00	$ 31,603.71	1,508	590	2,098
Broadwater	21	20,280.00	1,013.00	13,603.71	1,508	300	1,139
Carbon	53	167,225.00	2,953.71	52,218.42	4,054	1,740	5,794
Cascade	83	440,999.50	5,918.00	193,555.56	7,888	3,349	11,237
Chouteau	62	143,500.00	5,326.00	88,474.70	4,436	1,701	6,137
Custer	66	149,915.00	5,624.00	97,075.42	3,482	990	4,472
Dawson	59	88,160.00	4,095.00	52,354.90	3,009	1,695	4,704
Deer Lodge	23	208,155.00	3,669.00	60,160.70	3,131	1,566	4,697
Fergus	83	151,180.00	5,030.32	97,847.67	4,367	2,033	6,400
Flathead	50	191,145.00	4,020.00	112,132.79	4,884	1,899	6,783
Gallatin	59	223,323.00	3,215.00	79,931.56	3,905	1,546	5,451
Granite	15	38,115.00	1,719.00	13,489.80	805	271	1,076
Jefferson	24	68,500.00	1,028.82	40,644.65	1,272	480	1,752
Lewis and Clark	54	521,850.00	5,343.30	145,552.20	5,017	1,664	6,681
Lincoln	18	51,720.00	1,397.00	31,021.80	823	275	1,098
Madison	59	97,045.00	7,041.00	43,536.30	1,946	908	2,854
Meagher	27	57,910.00	1,265.85	40,235.24	842	298	1,140
Missoula	50	204,426.00	4,837.53	140,491.68	4,716	1,910	6,626
Park	53	140,261.00	2,570.00	53,745.63	2,704	1,326	4,030
Powell	23	81,009.00	490.00	25,325.00	1,410	511	1,921
Ravalli	35	127,675.00	3,787.00	76,441.56	3,093	1,161	4,254
Rosebud	33	67,107.40	3,440.00	43,126.80	1,153	564	1,717
Sanders	20	94,175.00	1,257.75	47,122.31	958	366	1,324
Silver Bow	35	973,830.00	5,047.11	355,204.12	11,570	5,763	17,333
Sweet Grass	36	65,745.00	1,992.15	23,791.09	1,054	431	1,485
Teton	27	50,905.00	2,145.00	46,640.75	1,927	1,039	2,966
Valley	44	131,002.17	3,124.00	62,174.11	3,203	1,787	4,990
Yellowstone	40	380,125.00	2,032.00	162,771.79	4,737	2,048	6,785
Total	1,188	$4,993,983.07	$91,019.44	$2,230,585.32	88,733	38,211	126,944

Higher Educational Institutions.

THE UNIVERSITY OF MONTANA.

Since the biennial report of 1908 the State University has had many important developments.

In the first place the measures passed by the General Assembly of 1909, gave to the University a system of government assimilated to that of the other state educational institutions. Financial control is vested in the State Board of Examiners, instead of in the Board of Education as formerly. Immediate control of all administrative matters is given to a new Executive Board of three members, the President of the University being ex officio its chairman. This Executive Board exercises strictly subordinate powers, as delegated by the State Board of Education and Board of Examiners.

The process of eliminating the Preparatory Department begun in September of 1908, has been fully completed. Only students prepared to undertake collegiate and professional courses are admitted. The faculty have raised the standards of their courses to a level with those maintained by other state universities under similar circumstances. Four years of work completed in any accredited high school course is the standard of unconditional entrance to regular courses.

The appropriations for maintenance during the biennium ending February 28, 1909, were $115,110; for the present biennium, to end February 28, 1911, these are $137,500. In consequence of increase in resources, the equipment of libraries and laboratories has been bettered, the faculty has been enlarged, and a slightly higher scale of salaries has been adopted. A new Library Building, with suitable fixtures and furniture, has been in use for the past year. An Infirmary Cottage for the care of students with contagious or infectious diseases has been erected. New laboratories have been provided for Chemistry, Physics, Geology, Forestry, Engineering and Psychology.

Forestry is a new department created to meet an obvious need and to utilize the advantages offered by the location of District No. 1 of the United States Forest Service in Missoula. The University provides a four years undergraduate course with Forestry as the major subject, and also a short course for practical foresters during January, February and March. In 1910 there were fifty students enrolled in the short course in Forestry. About one-half of the instruction was given by experts on the staff of the District Forestry Office.

Another new development is the organization of extension courses by lectures and correspondence. Besides single lectures in many towns, eight courses of six lectures each were given in six cities, with 544 persons regularly enrolled, from January to April of the present year, and a larger number of courses is now being arranged. Correspondence courses began

with simple provision for the needs of men in the Forest Service who can not attend even short courses at the University. Since then the work has been gradually extended until now most of the departments of the University offer courses by this method.

THE MONTANA STATE NORMAL COLLEGE.

Dillon has become widely known, not only throughout Montana but elsewhere as well, as an educational center. It is chiefly the Montana State Normal College that has gained it this reputation. This was the third of Montana's state educational institutes in the order of establishment, and began work in 1897.

The development of the Montana State Normal College has been peculiar in some respects. Probably the one thing that has distinguished it more than anything else has been the unvarying insistence on high standards from the very first. Those who are familiar with the history of such institutions know that a very common course has been to devote all energies at the start to securing as large a number of students as possible, accepting anybody and everybody with little regard to previous preparation. The fact, however, that the Montana State Normal College was established for the training of teachers has been kept clearly in view, and the determination has been to give training of the highest character, with the idea that a small number of students well trained would give the college, in the long run, a much better reputation than mere numbers.

The result is that, while Montana was one of the latest states to establish a normal school, the requirements for graduates here are on a par with those in any of the older states, and indeed higher than in many states much farther east.

The advantages of adhering to this plan are readily apparent, for the call for experienced graduates as teachers in good positions is every year much greater than the supply. The State accepts the diplomas of the Normal College as licenses to teach without any further examination, and as soon as graduates have proved themselves by one or two years of successful experience, the State grants them life diplomas. These diplomas are also recognized quite generally in other states as well.

The work of the Normal College has also been thoroughly tested by other institutions, and has been found to be of such a quality that students who go elsewhere for more advanced study seldom find any difficulty in making the transfer on the basis of work done here. Such leading universities as Cornell, Columbia, Michigan, Wisconsin, and California have deemed credentials from the Montana State Normal College sufficient to entitle the holders to advance standing in those institutions.

Another particular in which the Montana State Normal College has been notable is in the character of its faculty. It is well known that many normal schools and colleges employ as teachers some persons of very limited education and little or no practical experience. The Montana State Normal College, however, employs no teachers in responsible positions who have not at least supplemented a university course by some years of graduate study, and even the youngest assistants have been trained

in some of the best professional schools in the country. Rarely is a teacher appointed whose ability has not already been demonstrated by some years of successful experience in some other normal school or college of high character.

Few, except the larger colleges, enjoy so excellent an equipment as the Montana State Normal College, and visitors from abroad alwoys express surprise at the completeness observed in this respect. Everywhere in the libraries, laboratories, gymnasium, classrooms, everything provided is of a substantial and durable character and is thoroughly up-to-date.

MONTANA STATE SCHOOL OF MINES.

The State of Montana maintains a school of mines, the object of which is to train young men in the technical branches of learning required in the mining of minerals of the West and in the operation of the various smelters and reduction works.

Students of School of Mines, at Work.

It has been the general policy of the officers placed in charge of the institution to build all departments in a most substantial manner. By keeping the institution strictly within the limits of its original purpose it has been possible to obtain a degree of excellence equal to the best offered in the West in this line of learning. The School was opened in 1900 and has graduated eight classes, giving the degree of Engineer of Mines to sixty-six young men, and it may be offered in support of the excellence of the training given these young men, that every one of them is engaged in the pursuit of his profession.

The school is located just inside the city limits of Butte, one of the

great mining centers of the world. Being thus located the students are educated in an atmosphere of mining. They are brought into daily contact with men of prominence in the mining world. It is also possible to conduct excursions as frequently as desirable to the mining and metallurgical plants in the vicinity of the school supplementing the lectures and recitations in the School. It is believed that the location of the Montana State School of Mines is unrivalled in the opportunities it offers for such excursions.

The School is housed in three substantial buildings located on a commanding site on the Southern bench of "Big Butte," the extinct volcano from which the city takes its name. The main building was constructed at a cost of $120,000.00 and contains about 37,000 square feet of available floor space. It is nearly fireproof and is well adapted to its purpose. The mill building is designed to house the ore dressing and metallurgical machinery. The building is 110 feet by 72 feet and houses machinery whose value is about $25,000.00. The other building is just nearing completion and is designed to be a gymnasium and general assembly hall. It is believed that this building will add much to the social life of the students and offer wholesome amusement for their hours of recreation.

The equipment in general represents a careful selection of the latest and best apparatus for the different departments of the School, and the total sum invested amounts to about $75,000.00. The proximity to large bodies of various kinds of ore permits the use of commercial mill machinery in making tests in ore dressing and many lines of metallurgy. The students are thus given a familiarity in operating machinery which is a most valuable asset, seldom acquired in a mining school.

While it is recognized that the information imparted is of great importance, it is ever kept in mind that the development of the student in general ability and resourcefulness is the most important end to be obtained. Thus in mine surveying, for example, the students are taken into the mines to work out the problems assigned. It is not enough that the proper methods be understood, the student must meet requirements in accuracy, rapidity and neatness as well. The same idea pervades the teaching of chemistry, geology, metallurgy and other subjects taught at School. This training adds confidence and assurance to the young graduates in entering upon the practice of their profession.

In selecting the faculty the Board of Control have secured men who possess a practical acquaintance with their specialities, thus securing to the students assurance that their time will be spent to the very best advantage.

MONTANA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

The purpose of the College of Agriculture and Mechanic Arts is to provide training in agriculture, engineering, home economics and other applied sciences for the young men and women of Montana. College courses which require four year high school courses for admission are maintained in agronomy, animal industry, dairying, horticulture, domestic science,

electrical, civil and mechanical engineering, economic biology, industrial chemistry, mathematics and physics, history and literature. Two and three year courses in pharmacy are offered. The schools of art and music afford opportunity for specialization in these subjects. There are also courses in agriculture, mechanic arts and home science for those who have completed the eight grade in the common schools. Several short winter courses are given for mature persons who have had considerable experience. Among these are stock judging, fruit growing, poultry and dairy.

The inventory shows that the campus and farms are valued at $74,000, the buildings at $279,500, and the equipment at $122,250. The College received a land grant of 140,000 acres of land of which 18,580 acres have been sold. The permanent fund now amounts to $333,225 and the income from this is about $15,000 per year. About $10,000 is received each year from leased lands. By the terms of the Second Morril Act and the Nelson Amendment, the College has an annual appropriation from the United States Treasury of $50,000. These amounts are supplemented by appropriations out of the general fund of the state. All buildings are erected by the state.

The students are very largely pursuing technical courses of study. During the past year the number enrolled was 421 of which 134 were in agriculture, 103 in engineering mechanic arts, 92 in domestic science, 59 in general science, 33 in music. In addition to the regular work, many successful organizations are maintained. Among these may be mentioned the Young Men's and Young Women's Christian Associations, the oratorical, literary, agricultural and engineering societies, the college band and the athletic association. The Weekly Exponent is the student organ. Intercollegiate games of foot ball, basket ball, track and base ball are participated in. The college is represented in the State oratorical contests and debates with other institutions.

The College is located at Bozeman, on the main line of the Northern Pacific Railway and a branch of the C. M. and P. S. Railroad. For convenience, healthfulness, and beauty of surroundings the site is a model one. Bozeman is a city of homes and churches with a wholesome moral atmosphere. A dormitory has just been completed which affrods a good home for young ladies at reasonable rates.

In connection with the college is the Experiment Station which conducts experiments in agriculture. The Station issues a series of bulletins which give the results of the experiments. These are sent free to any citizen of Montana.

THE UNIVERSITY OF MONTANA.

MISSOULA.

Executive Board.

C. A. Duniway ..... Chairman (ex-officio).
A. L. Duncan ....Term Expires April 19, 1911.
J. H. T. Ryman, Treasurer .....Term Expires April 19, 1913.
J. B. Speer .... Secretary.

UNIVERSITY FACULTY.

The Faculty as at present constituted is as follows:
Clyde A. Duniway, Ph. D., President.
William M. Aber, A. B., Professor of Latin and Greek.

Frederick C. Scheuch, B. M. E., A. C., Professor of Modern Languages.
Morton J. Elrod, Ph. D., Professor of Biology.
Frances Corbin, B. L., Professor of Literature.
William D. Harkins, Ph. D., Professor of Chemistry.
Jesse P. Rowe, Ph. D., Professor of Geology.
William F. Book, Ph. D., Professor of Psychology and Education.
Joseph H. Underwood, Ph. D., Professor of History and Economics.
Louis C. Plant, M. S., Professor of Mathematics.
Arthur W. Richter, M. M. E., Professor of Engineering.
Joseph E. Kirkwood, Ph. D., Professor of Botany and Forestry.
George F. Reynolds, Ph. D., Professor of English and Rhetoric.
Gustav L. Fischer, Professor of Music.
Robert N. Thompson, B. S., Assistant Professor of Physics.
E. M. Shealy, M. M. E., Assistant Professor of Engineering.
Robert H. Cary, B. S., Director of Physical Culture.
Eloise Knowles, M. A., Instructor in Fine Arts.
Mary Stewart, A. B., Instructor in English and Dean of Women.
Eugene F. A. Carey, B. S., Instructor in Mathematics.
Mabel R. Smith, M. A., Instructor in Public Speaking, and in Physical Culture; Acting Dean of Women.
William R. Plew, Instructor in Engineering.
J. Howard Stoutmeyer, Ph. D., Instructor in History and Education.
J. W. Hill, M. A., Instructor in Chemistry.
Helen F. Walker, L. B., Ph. B., Instructor in English and German.
James B. Speer, B. A., Registrar and President's Secretary.
Gertrude Buckhous, B. S., Librarian.
Margery W. Feighner, B. A., Assistant Librarian.

SUMMARY OF REGISTRATION.

1909–1910.

	Men.	Women.	Total.
Graduates	1	1	2
Seniors	9	21	30
Juniors	21	13	34
Sophomores	13	21	34
Freshmen	22	32	54
	66	88	154

September–December, 1910.

Graduates	1	2	3
Seniors	17	13	30
Juniors	13	18	31
Sophomores	15	16	31
Freshmen	58	23	81
	104	72	176

MONTANA COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

Executive Board in Charge of the College and Experiment Station—

President James M. Hamilton (ex-officio), Chairman ..... Bozeman

By Appointment—

Walter S. Hartman (term expires April, 1913) ..... Bozeman
J. H. Baker (term expires April, 1911) ..... Bozeman
George Cox, Treasurer ..... Bozeman
George R. Callaway, Secretary ..... Bozeman

Faculty.

James M. Hamilton, M. S. (Union Christian College), President. Professor of Philosophy and Economics.
Mrs. F. E. Marshall, Professor of Art.
William F. Brewer, A. M. (Harvard University), Professor of English.
Aaron H. Currier, A. M. (Oberlin College), Professor of Modern Languages.
Miss Lilla A. Harkins, M. S. (South Dakota Agricultural College), Professor of Domestic Science.
Robert A. Cooley, B. S. (Massachusetts Agricultural College), Professor of Zoology and Entomology.
William D. Tallman, B. S. (University of Wisconsin). Professor of Mathematics.
Frederick B. Linfield, B. S. A. (Ontario Agricultural College), Professor of Agriculture.
William M. Cobleigh, A. M. (Columbia University), Professor of Chemistry.
Joseph A. Thaler, E. E. (University of Minnesota), Professor of Electrical Engineering.
Alfred Atkinson, B. S. A. (Iowa State College), Professor of Agronomy.
Robert W. Clark, B. S. A. (University of Minnesota), Professor of Animal Industry.
Charles S. Dearborn, B. S. (Kansas State Agricultural College), Professor of Mechanical

Engineering.
Dean B. Swingle, M. S. (University of Wisconsin), Professor of Botany and Bacteriology.
Robert D. Kneale, C. E. (Purdue University), Professor of Civil Engineering.
Orville B. Whipple, B. S. (Kansas State Agricultural College), Professor of Horticulture.
Walter J. Taylor, D. V. M. (Cornell University), Professor of Veterinary Science.
M. Herrick Spaulding, A. M. (Leland Stanford, Jr., University), Assistant Professor of Zoology.
Miss Helen R. Brewer, A. B. (Grinell College), Assistant Professor of History and Latin.
Miss Mary A. Cantwell, Principal of the Preparatory School and Assistant Professor of English.
Frank W. Ham, M. S. (Montana Agricultural College), Assistant Professor of Physics.
Charles E. Mollett, Ph. C. (University of Kansas), Assistant Professor of Pharmacy.
Frank C. Snow, C. E. (Ohio State University), Assistant Professor of Civil Engineering.
J. W. Marshall, B. S. (Cornell University), Assistant Professor of Mechanical Engineering.
John H. McIntosh, B. L. (University of Georgia), Director of Athletics and Instructor in Physical Training.
Howard F. Patterson, B. S. A. (Iowa State College), Assistant Professor of Agronomy.
Edward A. Duddy, A. M. (Harvard University), Assistant Professor of English.
Roy C. Jones, B. S. (University of Vermont), Assistant Professor of Dairying.
Miss Florence Ballinger, Instructor in Sewing.
William F. Schoppe, B. S. (University of Maine), Instructor in Poultry Management.
Lana A. Baldwin, Instructor in Art.
Miss Frieda Bull, M. S. (Montana Agricultural College), Instructor in Mathematics.
Harvey P. Griffin, B. S. (University of Missouri), Instructor in Animal Industry.
Ralph T. Challender, B. S. (Kansas State State Agricultural College), Instructor in Mechanical Engineering.
R. A. Barnes, B. S. (University of Wisconsin), Instructor in Cremistry.
Miss Abigail Hess, B. S. (University of Illinois), Instructor in Home Science.
A. A. Perrine, B. S. (Kansas State Agricultural College), Instructor in Electrical Engineering.
Lyman G. Shermerhorn, B. S. (Massachusetts Agricultural College), Instructor in Horticulture.
Fred Kately, Assistant in Shop.
Miss Mary Kountz, Assistant in Art.
Earl Oliver (Toronto Conservatory), Vocal Music.
Paul McNeeley (University of Kansas), Instructor in Piano.
Miss Regina Barnes (Wooster Conservatory), Instructor in Piano.
Mrs. Mary K. Winter, Librarian.
Mrs. Una B. Herrick, Matron and Physical Training.

STATE SCHOOL OF MINES.

BUTTE.

Executive Board.

C. H. Bowman. J. C. Adams. T. D. Slemons.

Faculty.

C. H. Bowman, President and Professor of Mechanics.
G. W. Craven, Professor of Mathematics and Mechanics.
Theodore Simons, Professor of Mining and Mining Engineering.
D. C. Bard, Professor of Mineralogy and Geology.
A. E. Adami, Instructor in Drawing and Mathematics.
L. J. Hartzell, Professor of Chemistry.
Earle B. Young, Instructor in Mathematics and Mechanics.

MONTANA STATE NORMAL COLLEGE.

DILLON.

Executive Board.

H. H. Swain, Chairman and Secretary ..... Dillon

Jas. P. Murray, Appointed April, 1909, Term Expires April, 1913..... Dillon
R. R. Rathbone, Secretary, Appointed April, 1909, Term Expires April, 1911..... Dillon

Faculty.

Henry H. Swain, Ph. D., President.
Joseph E. Monroe, B. A., Physics and Chemistry.
Lucy H. Carson, M. A., English.
Anna W. Owsley, Matron.
Laura M. Kress, B. L., Latin and German.
Robert Clark, M. A., Psychology and Biology.
Theodore Shoudy, Manual Arts.
Grace Graeter, Piano.
E. Ray Mosher, M. A., Mathematics.

Addie E. Bettes, Primary Training.
Harriet A. Dunning, Physical Culture.
Grant E. Finch, M. Ph., Superintendent of Training.
Louis Pelzer, Ph. D., History.
Nina M. Nash, Intermediate Training.
Carrie F. Hardesty, Vocal Music.
Lillian R. Free, Librarian.

Delia Dorchester, Amy E. Lees, Alice E. Russell, B. Pd., Catherine Cavanaugh, Annabel B. Long, Bert Shortt, Lillian A. Baker, Bertha A. Wells, Lydia Roberts, Elizabeth P. Jones, A. B., Alma A. Van de Walker, Mary L. Innes, Critic Teachers.

STATE ORPHANS' HOME.

TWIN BRIDGES.

Executive Board.

Wiley Mountjoy, President Ex-Officio.
Pat Carney, Waterloo.
E. D. Marsh, Sheridan.

Officials and Employees of State Orphans' Home.

Wiley Mountjoy, President.
Mrs. Wiley Mountjoy, Matron.
Miss Kate Falconer, Assistant Matron.
Wm. Disley, Teacher.
Miss Gertrude O'Rourke, Teacher.
Miss Emma Taylor, Teacher.
Miss Anna Buckner, Cottage Matron.
Mrs. D. W. Vickers, Cottage Matron.
Mrs. May Haviland, Cottage Matron.
Mrs. Wm. Armour, Cottage Matron.
Mrs. Lydia Emmerson, Matron of Nursery.
Miss Mabel Jones, Nurse of Nursery.
Miss Elis Shaw, Nurse of Nursery.
Mrs. Willett, Cook.
Miss Emma Pogson, Assistant Cook
Miss Eva Freedland, Dining Rooms.
Florence Dean, Dining Rooms.
Miss Belle Mickelberry, Seamstress.
Miss Cora Gilbert, Relief and Sewing Room.
Miss Grace Buckner, Relief and Sewing Room.
Miss Margaret Hughes, Nurse for Sick.
Chas. Whipple, Engineer.
R. R. Tovey, Engineer.
H. Newland, Teamster, etc.
Mrs. O'Haire, Laundress.
Miss Alta Dean, Baker, etc.
E. D. Baker, Physician.

MONTANA SCHOOL FOR THE DEAF AND BLIND.

BOULDER.

Executive Board.

L. E. Milligan, M. A., Ex-Officio Chairman.
Chas. Scharf, Secretary, Term Expires April 19, 1913.
M. H. Parker, Term Expires July 1, 1914.

Management and Instructors.

L. E. Milligan, M. A., President.
Miss B. DesRosier, Office Assistant.
H. E. Thompson, Head Teacher of the Deaf.
Miss Sadie Lillard, Teacher of the Deaf.
P. H. Brown, B. A., Teacher of the Deaf.
Miss Josephine Hayden, Teacher of the Deaf.
Miss Josephine Hayden, Teacher of Art.
H. E. Thompson, Librarian.
E. V. Kemp, Director of Physical Culture.
Miss Sadie Lillard, Teacher of Physical Culture.
J. Adams Morris, Teacher of the Blind (Literary).
Miss Ethel Cowan, Teacher of the Blind (Literary).
Miss Mary McRoberts, Teacher of the Blind (Music).

School for Backward Children.

T. A. Smith, Director.
Mrs. Grace Perry, Teacher.
J. T. Eastlick, Boys' Teacher of Industries.
Miss Martha Russell, Manual Training.
Miss Ella Dunaway, Teacher.
Miss Mollie E. Slack, Girls' Matron.
Miss Clara Kingman, Attendant and Teacher of Sewing.

Domestic Department.

Miss C. M. Ellis, Matron.
Mrs. Louise Warden, Trained Nurse.
A. L. Ward, M. D., Physician.
I. A. Leighton, M. D., Physician.
J. A. Donovan, M. D., Oculist and Aurist.
Dr. C. M. Eddy, Dentist.
Miss Bertha Finden, Girls' Supervisor.
Mrs. E. V. Kemp, Little Boys' Supervisor.
Fred J. Low, Boys' Supervisor.
V. J. McKinnon, Engineer.
John P. Finerty, Second Engineer.
H. L. Bond, Third Engineer.
James Spaur, Farmer.
Mrs. Jas. Spaur, Dairy.
George Morrison, Teamster.

Industrial Department.

P. H. Brown, Head Teacher, Carpenter.
E. V. Kemp, Printing.
Miss Bertha Finden, Sewing.
John Sullivan, Piano Tuning.
J. A. Morris, Broom Making, Basketry and Carpet Weaving.
Mrs. Louise Warden, Domestic Science and Home Nursing.

MONTANA STATE REFORM SCHOOL.

MILES CITY.

Executive Board.

H. W. George, President Ex-Officio.
W. E. Holt, Term Expires April 19, 1913.
C. W. Butler, Term Expires May 7, 1911.

Officers and Employees of the State Reform School.

H. W. George, President.
Mrs. H. W. George, Matron.
E. B. Winter, Secretary and School Teacher.
E. W. Pettersen. School Teacher.
Grace Walker, School Teacher.
Belle Carlton, Boys' Kitchen Officer.
E. W. Cook, Company "A" Officer.
H. S. Cook, Company "B" Officer.
F. A. Walker, Houseman.
H. E. Davis, Farmer.
Wm. J. Miller, Engineer.
Winifred Gibbs, Girls' Kitchen Officer.
Jens Halvorsen, Instructor in Shoemaking.
Joseph Bernhardt, Instructor in Tailoring.
A. W. Barnard, Instructor in Manual Training.
J. V. Morford, Night Watchman.

ASSESSED VALUATION.

Total Assessed Valuation of Cattle for the Year 1909.

COUNTIES.	Beef.		Yearlings.		Two-Year-Olds.		Three-Year-Olds.		Cows.		Stock Cattle.		Total.
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
Beaverhead	6,831	$204,810	9,779	$ 97,811	9,530	$152,528	15,639	$392,420	982	$ 29,465	9,351	$ 278,805	$1,155,839
Broadwater	39	1,308	2,668	26,680	1,733	27,731	263	7,929	888	26,640	7,247	130,401	220,689
Carbon	502	15,121	2,843	28,936	1,536	27,092	.....	.....	2,147	57,335	12,392	264,812	393,296
Cascade	935	28,985	.....	.....	.....	.....	.....	.....	2,323	69,690	38,084	685,512	784,187
Choutean	.....	.....	79	955	14	224	.....	.....	1,125	33,820	46,206	831,242	866,241
Custer	3,903	102,572	3,823	38,230	3,125	49,874	.....	.....	646	19,415	93,540	1,724,583	1,934,674
Dawson	5,693	154,611	3,001	30,010	2,976	44,445	.....	.....	1,011	30,507	22,788	415,388	674,961
Deer Lodge	.....	.....	387	3,870	348	5,495	467	12,568	916	26,645	1,604	29,055	77,633
Flathead	*84	8,400	643	6,560	217	3,175	20	590	1,694	52,615	3,349	71,545	142,885
Fergus	.....	.....	725	7,250	.....	.....	.....	.....	1,396	41,880	44,984	809,712	858,842
Gallatin	905	25,355	.....	.....	.....	.....	.....	.....	2,000	59,970	8,935	318,585	403,910
Granite	319	9,435	3,301	33,010	3,169	50,704	637	17,199	791	23,730	5,780	105,603	239,681
Jefferson	151	2,020	2,359	24,118	1,860	30,911	554	14,754	1,671	45,485	5,796	111,896	229,184
Lewis and Clark	.....	.....	1,469	14,840	1,868	29,540	934	26,740	2,152	63,085	20,109	363,920	498,125
Lincoln	.....	.....	166	1,110	63	875	.....	.....	235	7,085	799	14,690	23,760
Madison	2,553	91,700	3,514	35,140	2,180	36,340	.....	.....	1,450	43,935	2,413	423,035	630,150
Meagher	523	15,690	5,005	50,050	.....	.....	.....	.....	369	9,225	19,954	323,080	398,045
Missoula	23	895	1,451	14,659	1,094	17,602	667	17,660	1,679	49,990	3,041	53,932	154,738
Park	835	29,074	606	6,155	128	1,880	.....	.....	1,993	60,488	13,008	232,430	330,027
Powell	1,227	38,140	3,650	36,500	343	5,488	.....	.....	945	25,245	10,480	188,640	294,013
Ravalli	.....	.....	2,018	20,356	1,105	17,500	278	7,803	2,178	64,837	2,391	43,349	153,845
Rosebud	.....	.....	255	2,866	2,541	65,814	3,198	71,520	602	14,635	53,399	961,888	1,116,723
Sanders	.....	.....	394	3,940	299	4,774	75	2,023	420	12,630	499	9,119	32,486
Sweet Grass	.....	.....	3,551	35,510	320	5,465	367	10,511	933	27,990	13,225	238,070	317,546
Silver Bow	.....	.....	275	2,955	211	3,345	95	2,320	2,505	76,035	1,185	23,755	108,410
Teton	2,008	62,969	105	1,250	1,465	25,192	8	400	618	15,450	27,379	492,822	598,083
Valley	.....	.....	.....	.....	.....	.....	2,278	61,506	.....	.....	26,341	421,456	482,962
Yellowstone	1,093	30,310	812	8,120	797	11,745	5	200	1,900	57,200	18,868	340,233	447,888
The State	27,524	$821,395	52,879	$530,881	36,932	$617,739	25,485	$646,143	35,569	$1,045,027	513,147	$9,907,558	$13,568,823

* Buffalo.

ASSESSED VALUATION.

Total Assessed Valuation of Sheep for the Year 1909.

COUNTIES.	Sheep.		Lambs.		Rams.		Total.
	Number.	Value.	Number.	Value.	Number.	Value.	
Beaverhead	159,134	$ 521,262	.....	$.....	1,952	$ 9,760	$ 531,022
Broadwater	52,311	156,933	.....	.....	280	1,400	158,333
Carbon	146,769	440,288	.....	.....	1,354	5,198	445,486
Cascade	103,121	309,363	10,700	32,100	385	1,925	343,388
Chouteau	586,730	1,809,235	86,300	217,400	5,266	31,316	2,057,951
Custer	506,900	1,520,706	.....	.....	4,878	24,400	1,545,100
Dawson	276,796	830,388	40,741	106,739	2,475	13,200	950,327
Deer Lodge	2,840	8,520	.....	.....	.....	.....	8,520
Flathead	406	1,230	.....	.....	.....	.....	1,230
Fergus	470,329	1,410,987	.....	.....	2,656	13,[illegible]	1,424,267
Gallatin	36,038	108,175	.....	.....	..	.....	108,175
Granite	8,390	25,170	.....	.....	81	405	25,575
Jefferson	14,016	49,548	3	11	51	255	49,814
Lewis and Clark	120,282	368,035	.....	.....	.....	.....	368,025
Lincoln	.....	.....	.....	.....	.....	.....	.....
Madison	105,804	317,460	4,550	13,650	2,930	10,240	341,350
Meagher	238,348	715,044	.....	.....	3,230	16,150	731,194
Missoula	2,508	6,956	.....	.....	... ..	.....	6,956
Park	91,896	278,648	2,128	6,484	537	2,835	287,967
Powell	63,901	191,763	.....	.....	.....	.....	191,763
Ravalli	18,864	56,592	2,025	6,075	162	810	63,477
Rosebud	305,070	944,910	700	1,400	1,771	10,955	957,265
Sanders	7	21	.....	.....	1	5	26
Sweet Grass	286,620	859,860	.....	.....	2,282	11,410	871,270
Silver Bow	6,770	20,910	.....	.....	.....	.....	20,910
Teton	263,548	790,644	.....	.....	1,623	10,340	800,984
Valley	189,544	521,246	.....	.....	670	3,350	524,596
Yellowstone	349,683	1,049,049	.....	.....	699	3,495	1,052,544
The State	4,407,525	$13,312,937	147,147	$383,859	32,413	$170,729	$13,867,525

ASSESSED VALUATION.

Total Assessed Valuation of Hogs and Goats for the Year 1909.

COUNTIES.	Hogs.		Goats—Angora.	
	Number.	Value.	Number	Value.
Beaverhead	384	$ 2,387	.....	$.....
Broadwater	929	2,862	.....	.....
Carbon	1,193	5,960	.....	.....
Cascade	902	4,510	35	175
Chouteau	304	1,575	70	350
Custer	203	1,018	55	165
Dawson	466	2,624	.....	.....
Deer Lodge	218	1,375	.....	.....
Flathead	908	4,920	.....	.....
Fergus	1,480	7,400	.....	.....
Gallatin	1,892	11,545	.....	.....
Granite	211	1,055	330	890
Jefferson	251	1,323	183	917
Lewis and Clark	558	2,790	.....	.....
Lincoln	154	810	.....	.....
Madison	925	6,320	335	1,055
Meagher	257	1,285	16	48
Missoula	946	4,862	.....	.....
Park	1,626	8,145	.....	.....
Powell	291	1,455	.....	.....
Ravalli	2,263	9,868	.....	.....
Rosebud	309	1,965	230	690
Sanders	189	971	5	15
Sweet Grass	479	2,437	600	1,800
Silver Bow	439	2,475	.....	.....
Teton	293	1,505	83	415
Valley	471	2,355	.....	.....
Yellowstone	762	3,810	.....	.....
The State	19,303	$99,607	1,942	$6,520

ASSESSED VALUATION.

Total Assessed Valuation of Horses for the Year 1909.

COUNTIES.	Thoroughbred.		Range.		Common, Work and Mules.		Total.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Beaverhead	116	$ 35,300	6,073	$ 211,005	2,676	$ 201,215	8,865	$ 447,520
Broadwater	44	14,025	2,783	83,080	1,574	82,635	4,401	179,740
Carbon	.....	.....	3,529	123,145	3,780	218,095	7,309	341,240
Cascade	32	17,760	4,177	126,695	5,131	271,319	9,340	415,774
Chouteau	125	35,285	8,262	219,220	4,810	275,240	13,197	529,745
Custer	222	45,910	21,030	675,284	4,287	238,025	25,539	959,219
Dawson	152	20,455	15,949	549,757	2,466	243,660	18,567	813,872
Deer Lodge	370	18,905	1,152	35,269	885	40,175	2,377	94,349
Flathead	32	6,675	1,492	49,785	2,375	118,845	3,899	175,395
Fergus	91	26,745	7,366	257,810	6,382	343,610	13,839	628,165
Gallatin	40	21,200	3,600	133,255	6,435	358,330	10,075	512,785
Granite	35	5,900	3,012	57,330	1,249	66,005	4,296	129,235
Jefferson	13	6,500	1,674	49,651	1,395	75,370	3,082	131,521
Lewis and Clark	.....	11,600	.....	124,780	.....	146,180	.....	282,560
Lincoln	8	1,950	463	15,765	265	12,875	736	30,590
Madison	96	27,150	7,741	204,010	3,682	187,505	11,519	418,665
Meagher	76	20,775	2,688	55,800	1,520	77,500	4,284	153,875
Missoula	28	5,310	2,172	62,353	3,099	161,580	5,299	229,243
Park	39	12,250	3,638	117,697	2,851	222,023	6,528	351,970
Powell	79	13,600	2,773	97,417	1,852	93,325	4,704	204,342
Ravalli	124	13,790	2,671	78,062	2,545	136,000	5,340	227,852
Rosebud	32	8,110	5,709	158,845	3,127	170,835	8,868	337,790
Sanders	9	5,100	581	20,314	718	38,090	1,308	63,504
Sweet Grass	35	12,600	1,913	66,665	2,018	120,715	3,966	199,980
Silver Bow	37	4,700	994	33,435	2,276	117,020	3,307	155,155
Teton	59	28,150	5,085	177,975	2,898	146,499	8,042	352,624
Valley	44	12,700	8,200	261,000	3,901	293,030	12,145	566,730
Yellowstone	32	13,800	4,051	141,565	4,172	233,400	8,255	388,765
The State	2,017	$446,245	132,314	$4,187,059	81,152	$4,688,901	215,483	$9,322,205

1909 VALUATION, STATE OF MONTANA, FIXED BY THE ASSESSORS OF THE VARIOUS COUNTIES AND EQUALIZED BY THE BOARDS OF COUNTY COMMISSIONERS.

	Valuation Fixed by the Assessors of the Various Counties and Equalized by the Boards of County Commissioners.					Valuation Fixed by State Board of Equalization.	
	Live Stock.	All Other Personal Property.	Total Value of All Personal Property.	Real Estate.	Total Real and Personal Property.	Railroad Valuation.	Total Valuation of County.
Beaverhead	$ 2,136,768	$ 792,111	$ 2,928,879	$ 2,942,899	$ 5,871,778	$ 1,518,561	$ 7,390,339
Broadwater	561,624	316,423	878,047	1,158,969	2,037,016	1,043,258	3,080,274
Carbon	1,185,982	1,013,865	2,199,847	3,350,378	5,550,225	936,806	6,487,031
Cascade	1,548,034	2,728,080	4,276,114	12,400,132	16,676,246	2,552,571	19,228,817
Chouteau	3,455,862	1,336,294	4,792,156	4,003,503	8,795,659	5,338,195	14,133,854
Custer	4,440,176	1,460,182	5,900,358	4,776,783	10,677,141	3,046,064	13,723,205
Dawson	2,441,784	670,108	3,111,892	2,476,160	5,588,052	1,241,482	6,829,534
Deer Lodge	181,877	2,012,673	2,194,550	5,913,793	8,108,343	720,703	8,829,046
Flathead	324,430	1,495,031	1,819,461	5,100,625	6,920,086	2,216,766	9,136,852
Fergus	2,918,674	2,316,821	5,235,495	7,475,933	12,711,428	2,070,192	14,781,620
Gallatin	1,036,415	1,357,235	2,393,650	7,177,750	9,571,400	2,214,344	11,785,744
Granite	396,436	428,977	825,413	1,175,615	2,001,028	632,274	2,633,302
Jefferson	412,759	997,504	1,410,263	1,721,627	3,131,890	2,473,257	5,605,147
Lewis and Clark	1,151,510	4,536,360	5,687,870	12,036,697	17,724,567	1,874,811	19,599,378
Lincoln	55,160	243,879	299,039	2,037,320	2,336,359	2,361,083	4,697,442
Madison	1,397,540	1,219,477	2,617,017	3,301,115	5,918,132	867,675	6,785,807
Meagher	1,284,447	783,790	2,068,237	2,753,663	4,821,900	1,676,246	6,498,146
Missoula	395,799	2,876,200	3,271,999	8,044,941	11,316,940	3,119,217	14,436,157
Park	978,109	1,395,718	2,373,827	4,638,081	7,011,908	1,238,348	8,250,256
Powell	691,573	416,095	1,107,668	2,475,556	3,583,224	1,297,589	4,880,813
Ravalli	455,042	860,776	1,315,818	3,314,356	4,630,174	504,801	5,134,975
Rosebud	2,414,433	478,931	2,893,364	2,216,972	5,110,336	3,138,516	8,248,852
Sanders	97,002	421,278	518,280	1,417,233	1,935,513	2,352,534	4,288,047
Silver Bow	286,950	14,053,325	14,340,275	19,440,615	33,780,890	2,212,325	35,993,215
Sweet Grass	1,393,033	496,520	1,889,553	1,922,110	3,811,663	1,013,391	4,825,054
Teton	1,753,611	547,768	2,301,379	2,418,849	4,720,228	2,877,461	7,597,689
Valley	1,576,643	811,648	2,388,291	1,542,695	3,930,986	3,934,769	7,865,755
Yellowstone	1,893,007	2,428,220	4,321,227	9,383,876	13,705,103	3,949,610	17,654,713
Totals	$36,864,680	$48,495,289	$85,359,969	$136,618,246	$221,978,215	$58,422,849	$280,401,064
Same property 1908	33,013,809	45,499,755	78,513,564	124,318,239	202,831,803	45,942,989	248,774,792

	MAIN LINE.								SIDE TRACKS.			, aluation Main Line and Side Tracks.	Valuation by Systems.
	Franchise.	Roadway.	Roadbed.	Rails.	Rolling Stock.	Value per Mile.	Mileage Main Line.	Valuation Main Line.	Mileage.	Per Mile.	Value.		
Wyoming State Line to Huntley Branch Chicago, Burlington & Quincy Railroad	$ 800	$1,200	$4,000	$4,000	$2,000	$11,000	101.74	$ 1,119,140	27.58	$1,100	$ 30.338	$ 1,149,478	
Toluca Branch C. B. & Q. Railroad....	300	300	2,000	1,200	200	4,000	85.54	342,160	5.47	400	2,188	344,348	$ 1,493,826
Butte, Anaconda & Pacific	1,100	1,265	7,700	3,960	4,950	18,975	25.30	480,067	48.32	1,897	91,663	571,730	
Spurs	400	800	6,500	3,800	2,500	14,000	19.37	271,180	17.30	1,400	24,220	295,400	
Stuart Branch	100	400	2,900	900	700	5,000	8.94	44,700	4.46	500	2,230	46,930	914,060
Great Northern (main line)	1,100	1,265	7,700	3,960	4,950	18,975	691.41	13,119,505	151.83	1,897	288,021	13,407,526	
Havre to Butte Line	1,100	1,265	7,700	3,960	4,950	18,975	290.77	5,517,361	82.39	1,897	156,293	5,673,654	
Sweet Grass Branch, Armington to Shelby	800	1,200	4,000	3,000	2,000	11,000	127.11	1,398,210	18.81	1,100	20,691	1,418,901	
Sweet Grass Branch, Virden to Sweet Grass	100	400	2,900	900	700	5,000	36.30	181,500	1.19	500	595	182,095	
Fernie Branch	100	400	2,900	900	700	5,000	8.86	44,300	1.68	500	840	45,140	
Somers' Spur	400	1,200	2,000	800	600	5,000	10.45	52,250	2.24	500	1,120	53,370	
Kalispell Branch	625	1,250	6,250	2,500	1,875	12,500	15.63	195,375	4.46	1,250	5,575	200,950	
Marion Spur	125	600	1,000	400	180	2,305	25.36	58,455	1.23	230	282	58,737	
Barker Branch	125	....	....	....	....	125	10.79	1,348	....	....	.....	1,348	
Sand Coulee Branch	400	700	4,200	2,700	2,000	10,000	11.11	111,100	3.85	1,000	3,850	114,950	
Neihart Branch	250	350	1,900	1,900	1,250	5,650	38.18	215,717	3.42	565	1,932	217,649	
Mountain View Spur	300	500	4,200	1,900	1,100	8,000	3.32	26,560	0.77	800	616	27,176	
Red Mountain Branch	60	200	495	400	....	1,155	1.47	1,697	....	....	.....	1,697	
Fair Ground Spur	50	100	300	57	....	507	0.68	345	0.15	50	7	352	
Billings Branch	1,000	1,900	4,000	2,500	3,500	12,000	194.53	2,334,360	33.90	1,200	40,680	2,375,040	23,778,585
Northern Pacific (main line)	1,100	1,265	7,700	3,960	4,950	18,975	779.34	14,787,977	404.02	1,897	766,426	15,554,403	
Bitter Root Branch	750	1,000	6,750	2,600	3,900	15,000	47.37	710,550	9.09	1,500	13,635	724,185	
Bitter Root Branch Extension	150	700	1,500	500	150	3,000	16.45	49,350	7.32	300	2,196	51,546	
Boulder Branch	100	300	1,200	900	....	2,500	7.91	19,775	1.77	250	443	20,218	
Butte Line	1,100	1,265	7,700	3,960	4,950	18,975	71.19	1,350,830	32.50	1,897	61,653	1,412,483	
Clark's Fork	400	700	4,200	2,700	2,000	10,000	19.71	197,100	10.02	1,000	10,020	207,120	
Coeur d'Alene Branch	800	1,200	4,000	3,000	2,000	11,000	109.48	1,204,280	20.40	1,100	23,440	1,226,720	
Elkhorn Branch	100	260	900	870	870	3,000	20.13	60,390	2.05	300	615	61,005	
St. Regis Cut-Off ff	400	700	4,200	2,700	2,000	10,000	21.78	217,800	3.31	1,000	3,310	221,110	
Gaylord & Ruby Valley Branch	400	1,000	4,800	2,400	1,400	10,000	45.73	457,300	5.14	1,000	5,140	462,440	
Marysville Branch	200	565	2,500	1,900	1,600	6,765	12.58	85,104	1.46	676	987	86,091	
Montana Union	1,100	1,265	7,700	3,960	4,950	18,975	52.43	994,859	27.23	1,897	51,655	1,046,514	

	MAIN LINE.								SIDE TRACKS.			Valuation Main Line and Side Tracks.	Valuation by Systems.
	Franchise.	Roadway.	Roadbed.	Rails.	Rolling Stock.	Value per Mile.	Mileage Main Line.	Valuation Main Line.	Mileage.	Per Mile.	Value.		
Northern Pacific—(Continued)—													
Montana Union, Butte Hill Spur	300	500	3,500	1,000	700	6,000	8.66	51,960	6.21	600	3,726	55,686	
Park Branch	400	700	4,200	2,700	2,000	10,000	54.27	542,700	8.23	1,000	8,230	550,930	
Philipsburg Branch	250	450	2,000	1,700	800	5,200	25.94	134,888	4.09	520	2,127	137,015	
Pony Branch	250	450	3,000	1,950	350	6,000	6.65	39,900	0.44	600	264	40,164	
Red Bluff Branch	250	350	2,200	1,950	350	5,100	21.00	107,100	2.29	510	1,168	108,268	
Red Mountain Branch	100	100	750	600	182	1,732	16.51	28,595	4.48	173	775	29,370	
Rocky Fork Branch	750	1,000	6,750	2,600	3,900	15,000	44.38	665,700	17.10	1,500	25,650	691,350	
Wickes Branch	75	100	700	700	....	1,575	3.91	6,158	1.25	157	196	6,354	22,692,972
Yellowstone Park Railway	100	200	1,000	600	100	2,000	11.00	22,000	0.95	200	190	22,190	22,190
Chicago, Milwaukee & Puget Sound Ry. Co.	1,000	1,000	4,000	2,500	3,500	12,000	428.54	5,142,480	97.62	1,200	117,144	5,259,624	5,259,624
Montana Railroad, Lombard to Harlowton	1,000	1,000	4,000	2,500	3,500	12,000	92.80	1,113,600	19.25	1,200	23,100	1,136,700	
Harlowton to Lewistown	400	700	4,200	2,700	2,000	10,000	58.20	582,000	5.87	1,600	5,870	587,870	1,724,570
Oregon Short Line Railroad Co.	1,100	1,265	7,700	3,960	4,950	18,975	125.79	2,386,865	27.99	1,897	53,097	2,439,962	
Yellowstone Park Railroad Co.	400	700	4,200	2,700	2,000	10,000	9.55	95,500	1.56	1,000	1,560	97,060	2,537,022
							3,818.16	$56,570,091	1,130.69		$1,852,758	$58,422,849	$58,422,849
Same property in 1908							3,369.52	44,632,962	870.03		1,310,028	45,942,990	

ASSESSED VALUATION.

Total Assessed Valuation of Cattle for the Year 1910.

COUNTIES.	Beef.		Yearlings.		Two-Year-Olds.		Three-Year-Olds.		Cows.	
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Beaverhead	10,585	$ 370,640	9,789	$ 97,890	9,398	$150,418	2,840	$ 72,145	1,045	$ 31,015
Broadwater	64	2,200	2,810	28,100	1,712	27,392	88	2,640	884	26,520
Carbon	.....	.....	1,764	17,640	1,209	19,344	177	5,210	1,892	47,690
Cascade	1,111	39,030	.....	.....	.....	.....	.....	.....	2,973	90,655
Chouteau	.....	.....	100	1,200	.....	.....	46	1,496	1,012	30,460
Custer	.....	.....	2,871	28,930	2,082	35,856	3,217	99,522	907	27,230
Dawson	830	21,280	2,358	24,921	2,007	32,474	.....	.....	1,749	52,436
Deer Lodge	.....	.....	385	3,870	209	3,410	98	3,115	952	28,740
Flathead	.....	.....	584	5,830	326	5,080	18	405	1,945	58,350
Fergus	.....	.....	568	5,680	.....	.....	117	3,510	1,623	48,690
Gallatin	223	6,690	4,000	40,000	2,200	35,200	.....	.....	2,243	67,290
Granite	574	20,090	2,599	25,990	3,324	53,184	1,314	39,420	909	27,270
Jefferson	.....	.....	2,502	25,130	1,746	27,104	446	13,234	1,599	47,320
Lewis and Clark	.....	.....	1,550	15,680	729	12,669	270	8,845	2,173	64,145
Lincoln	.....	.....	429	4,320	310	4,930	12	420	263	7,970
Madison	1,785	59,980	3,800	38,110	.....	.....	.....	.....	1,692	50,860
Meagher	80	2,800	4,112	41,120	.....	.....	.....	.....	507	12,675
Missoula	36	1,545	1,360	14,863	1,412	22,038	513	14,938	1,609	53,199
Park	419	14,310	1,336	13,360	524	8,050	.....	.....	2,008	60,240
Powell	1,779	63,235	3,696	36,960	275	4,400	.....	.....	944	28,320
Ravalli	521	17,165	1,550	15,524	1,147	18,088	.....	.....	1,869	56,010
Rosebud	.....	.....	215	2,654	728	13,684	3,938	104,165	446	11,632
Sanders	.....	.....	402	4,052	230	4,116	56	1,632	430	12,808
Sweet Grass	.....	.....	3,305	33,050	2,236	35,776	1,191	36,570	1,193	35,790
Silver Bow	.....	.....	299	3,490	207	3,385	66	1,660	2,419	69,025
Teton	148	6,390	216	2,592	4,967	89,406	3,126	94,380	956	23,900
Valley	.....	.....	45	450	503	8,048	3,112	93,360	.....	.....
Yellowstone	.....	.....	924	9,240	803	12,848	691	24,475	2,278	68,540
The State	18,154	$625,355	53,569	$540 646	38,284	$626,891	21,336	$621,142	38,520	$1,138,780

ASSESSED VALUATION.

Total Assessed Valuation of Cattle for the Year 1910—(Continued).

COUNTIES.	Stock Cattle.		Thoroughbred.		Bulls.		Graded.		Total.
	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	
Beaverhead	17,946	$ 323,401	.....	.....	.....	$.....	.....	$.....	$ 1,045,509
Broadwater	6,177	111,186	.....	.....	.....	.....	.....	.....	198,038
Carbon	11,922	214,424	.....	.....	.....	.....	.....	.....	304,308
Cascade	36,478	656,604	193	7,615	.....	.....	.....	.....	793,904
Chouteau	41,358	745,479	.....	.....	19	1,275	.....	.....	779,910
Custer	89,069	1,623,398	208	8,610	.....	.....	.....	.....	1,823,546
Dawson	17,754	329,168	.....	.....	.....	.....	.....	.....	460,279
Deer Lodge	1,376	25,125	.....	.....	.....	.....	.....	.....	64,260
Flathead	5,136	87,380	.....	.....	.....	.....	.....	.....	157,045
Fergus	35,060	631,082	.....	.....	.....	.....	.....	.....	688,962
Gallatin	8,677	156,995	296	11,840	.....	.....	.....	.....	318,015
Granite	5,472	98,496	73	2,815	.....	.....	.....	.....	267,265
Jefferson	5,801	104,262	70	3,350	.....	.....	58	1,225	221,625
Lewis and Clark	16,161	322,145	.....	.....	.....	.....	.....	.....	423,475
Lincoln	834	15,810	.....	.....	.....	.....	.....	.....	33,450
Madison	24,846	451,045	.....	.....	.....	.....	.....	.....	599,095
Meagher	15,570	249,120	169	6,760	.....	.....	.....	.....	312,475
Missoula	2,223	40,958	.....	.....	.....	.....	.....	.....	147,541
Park	1,078	178,800	.....	.....	.....	.....	.....	.....	274,760
Powell	11,348	204,264	.....	.....	.....	.....	.....	.....	337,179
Ravalli	1,962	35,438	.....	.....	.....	.....	.....	.....	142,225
Rosebud	51,332	929,130	.....	.....	.....	.....	.....	.....	1,061,265
Sanders	364	6,538	6	240	.....	.....	2	55	29,441
Sweet Grass	8,836	159,223	.....	.....	.....	.....	.....	.....	300,409
Silver Bow	981	18,125	.....	.....	.....	.....	.....	.....	95,685
Teton	15,472	287,496	8	400	.....	.....	.....	.....	495,564
Valley	18,976	340,488	.....	.....	.....	.....	.....	.....	442,546
Yellowstone	17,684	300,322	.....	.....	.....	.....	.....	.....	415,425
The State	478,893	$8,636,902	1,023	$41,630	19	$1,275	60	$1,280	$12,233,901

ASSESSED VALUATION.

Total Assessed Valuation of Horses for the Year 1910.

COUNTIES.	Thoroughbred.		Range.		Common.		Total Value.
	Number.	Value.	Number.	Value.	Number.	Value.	
Beaverhead	117	$ 29,790	6,395	$ 226,905	2,878	$ 208,775	$ 465,470
Broadwater	51	14,375	2,659	80,515	1,674	90,240	185,130
Carbon	19	9,200	3,974	130,240	3,940	204,325	343,765
Cascade	57	23,350	4,103	144,160	5,928	324,750	*493,980
Chouteau	138	38,170	7,808	239,670	5,505	374,085	651,925
Custer	201	37,235	20,781	686,960	4,959	267,255	991,450
Dawson	18	23,390	12,721	524,830	5,007	429,020	977,240
Deer Lodge	180	9,920	981	26,255	1,024	49,070	85,245
Flathead	34	8,220	2,468	87,820	2,642	132,380	228,420
Fergus	77	22,475	7,201	252,035	7,279	376,735	651,245
Gallatin	42	20,140	4,085	144,225	6,253	370,855	535,220
Granite	44	6,425	2,100	62,100	1,104	57,595	126,120
Jefferson	12	6,430	1,720	57,685	1,313	69,139	133,254
Lewis and Clark	62	15,050	2,877	100,775	3,066	153,300	269,125
Lincoln	6	1,450	443	14,615	462	23,530	39,595
Madison	80	27,225	6,955	205,170	4,128	218,510	450,905
Meagher	83	19,100	2,577	53,460	1,718	85,900	158,460
Missoula	36	6,240	2,013	69,700	2,735	151,645	227,585
Park	40	10,850	3,123	108,870	3,573	245,405	365,125
Powell	78	13,950	2,764	98,120	1,554	77,750	189,820
Ravalli	69	9,900	2,168	70,675	2,680	141,910	222,485
Rosebud	27	9,150	6,177	199,595	4,252	229,305	438,050
Sanders	9	4,250	535	18,766	659	33,590	56,606
Sweet Grass	47	15,450	1,938	69,085	2,330	142,685	227,220
Silver Bow	66	6,550	734	25,500	2,101	104,905	136,955
Teton	9	5,100	5,398	188,930	3,360	168,000	†379,530
Valley	61	20,300	8,268	289,405	5,485	280,785	590,490
Yellowstone	34	14,100	3,727	131,635	4,932	275,850	421,585
The State	1,697	$427,785	126,683	$4,307,701	92,541	$5,287,294	$10,042,000

* 7 Jacks, $1,720. † 49 Graded, $15,250; 9 Jacks, $2,250.

ASSESSED VALUATION.

Total Assessed Valuation of Sheep for the Year 1910.

COUNTIES.	Sheep.		Lambs.		Rams.		Total.
	Number.	Value.	Number.	Value.	Number.	Value.	
Beaverhead	167,343	$ 551,190	.....	$.....	2,349	$ 11,745	$ 562,935
Broadwater	42,637	127,911	4,000	12,000	145	725	140,636
Carbon	180,544	541,632	.....	.....	794	3,970	545,602
Cascade	145,525	436,575	9,500	23,750	811	4,055	464,380
Chouteau	693,677	2,081,211	75,675	189,438	5,658	34,063	2,304,712
Custer	432,171	1,296,513	.....	.....	3,782	18,910	1,315,423
Dawson	304,521	917,513	34,248	84,163	2,406	13,740	1,015,421
Deer Lodge	5,302	15,906	.....	.....	.....	.....	15,906
Flathead	405	1,209	.....	.....	.....	.....	1,209
Fergus	461,624	1,615,682	.....	.....	2,808	14,040	1,629,722
Gallatin	33,730	101,190	.....	.....	20	160	101,350
Granite	13,522	40,566	.....	.....	161	805	41,371
Jefferson	6,024	18,069	.....	.....	100	500	18,569
Lewis and Clark	15,855	436,045	.....	.....	.....	.....	436,045
Lincoln	.....	.....	.....	.....	.....	.....	.....
Madison	116,322	349,315	.....	.....	2,415	12,075	361,390
Meagher	230,612	691,836	.....	.....	3,146	15,730	707,566
Missoula	2,512	7,666	.....	.....	.....	.....	7,666
Park	102,981	309,725	.....	.....	719	3,615	313,340
Powell	70,664	211,992	.....	.....	463	2,315	214,307
Ravalli	20,059	60,197	.....	.....	.....	.....	60,197
Rosebud	352,952	1,088,886	2,240	6,720	1,570	9,880	1,105,486
Sanders	19	52	.....	.....	.....	.....	52
Sweet Grass	255,371	776,113	43,961	131,883	3,135	15,675	923,671
Silver Bow	8,540	25,350	.....	.....	.....	.....	25,350
Teton	234,701	704,103	24,814	74,442	1,749	8,745	787,290
Valley	220,344	661,032	5,150	12,875	1,042	5,210	679,117
Yellowstone	332,590	949,170	.....	.....	728	3,640	952,810
The State	4,450,547	$14,016,649	199,588	$535,276	34,001	$179,598	$14,731,523

ASSESSED VALUATION.

Total Assessed Valuation of Hogs and Goats for the Year 1910.

COUNTIES.	Hogs.		Goats.	
	Number.	Value.	Number	Value.
Beaverhead	392	$ 1,980	.....	$ .....
Broadwater	850	2,550	4	20
Carbon	1,047	5,225	.....	.....
Cascade	1,601	8,005	75	305
Chouteau	310	1,560	.....	.....
Custer	358	2,200	160	800
Dawson	865	5,143	.....	.....
Deer Lodge	228	1,505	.....	.....
Flathead	1,067	5,385	.....	.....
Fergus	1,447	7,235	.....	.....
Gallatin	1,670	11,145	100	300
Granite	258	1,290	307	821
Jefferson	325	1,685	179	895
Lewis and Clark	590	3,265	.....	.....
Lincoln	249	1,360	10	30
Madison	1,009	8,385	325	975
Meagher	334	1,670	20	60
Missoula	1,068	5,432	.....	.....
Park	1,043	5,240	.....	.....
Powell	391	1,955	.....	.....
Ravalli	1,953	8,058	.....	.....
Rosebud	336	2,621	100	300
Sanders	242	1,235	.....	.....
Sweet Grass	493	2,465	650	1,950
Silver Bow	470	2,205	.....	.....
Teton	367	1,835	78	234
Valley	577	2,885	.....	.....
Yellowstone	1,149	5,745	.....	.....
The State	20,689	$109,264	2,008	$6,690

1910 VALUATION, STATE OF MONTANA, FIXED BY THE ASSESSORS OF THE VARIOUS COUNTIES AND EQUALIZED BY THE BOARDS OF COUNTY COMMISSIONERS.

	Valuation Fixed by the Assessors of the Various Counties and Equalized by the Boards of County Commissioners.						Valuation Fixed by State Board of Equalization.	
	Acres of Land Assessed.	Value of Same.	All Other Real Estate.	Live Stock.	All Other Personal Property.	Total Real and Personal Property.	Railroad Valuation.	Total Valuation of County.
Beaverhead	386,513	$ 1,430,107	$ 1,727,109	$ 2,075,894	$ 765,851	$ 5,998,961	$ 1,596,363	$ 7,595,324
Broadwater	244,798	762,661	446,228	526,374	353,388	2,088,651	1,116,965	3,205,616
Carbon	254,661	2,120,532	1,486,201	1,198,900	1,450,174	6,237,807	953,341	7,191,148
Cascade	1,054,608	5,298,308	8,079,010	1,760,574	3,354,370	18,492,262	2,754,558	21,246,820
Chouteau	644,368	2,552,591	2,163,466	3,738,107	1,676,776	10,130,940	5,605,699	15,736,639
Custer	1,762,569	6,048,794	2,331,948	4,133,419	1,651,388	14,165,549	3,392,160	17,557,709
Dawson	1,157,131	2,108,854	1,254,904	2,458,083	839,570	6,661,411	1,303,778	7,965,189
Deer Lodge	142,703	360,284	5,163,451	166,916	2,125,972	7,816,623	890,380	8,707,003
Flathead	760,662	3,487,495	1,859,725	392,059	1,759,277	7,498,556	2,346,549	9,845,105
Fergus	1,491,881	5,652,497	3,261,073	2,977,164	2,572,048	14,462,782	2,424,494	16,887,276
Gallatin	698,814	5,284,450	3,547,070	966,030	1,472,905	11,270,455	2,416,124	13,686,579
Granite	230,953	603,927	627,099	436,867	354,479	2,022,372	1,152,225	3,174,597
Jefferson	241,295	610,870	1,146,065	376,028	1,116,412	3,249,375	2,636,778	5,886,153
Lewis and Clark	627,792	1,912,868	10,465,412	1,131,910	5,434,065	18,944,255	1,964,395	20,908,650
Lincoln	514,374	2,042,280	276,350	74,435	301,190	2,688,255	2,477,546	5,165,801
Madison	558,761	1,558,872	1,792,913	1,421,650	1,263,713	6,037,148	928,211	6,965,359
Meagher	857,949	2,191,077	947,688	1,180,231	821,372	5,150,368	1,958,198	7,108,566
Missoula	825,748	2,926,795	5,502,009	388,224	3,010,132	11,827,160	4,972,827	16,799,987
Park	604,946	2,102,828	2,878,705	958,465	1,509,972	7,449,970	1,411,350	8,861,320
Powell	590,516	1,746,732	927,056	743,261	444,005	3,861,054	1,810,936	5,671,990
Ravalli	378,225	2,160,373	1,435,027	432,965	997,114	5,026,479	505,632	5,532,111
Rosebud	1,247,233	2,611,539	761,364	2,607,722	529,104	6,509,729	3,477,362	9,987,091
Sanders	356,070	1,036,184	419,432	87,334	336,195	1,879,145	2,527,840	4,406,985
Sweet Grass	647,286	1,894,963	584,126	1,455,715	605,902	4,540,706	1,064,128	5,604,834
Silver Bow	101,418	348,165	18,996,825	260,195	14,878,665	34,483,850	2,396,625	36,880,475
Teton	422,796	1,785,509	685,672	1,664,453	803,835	5,239,649	3,085,014	8,324,483
Valley	152,574	568,536	1,256,487	1,714,838	911,197	4,451,058	4,132,366	8,583,424
Yellowstone	999,600	5,283,925	5,752,823	1,795,565	2,960,750	15,793,063	4,394,402	20,187,465
	17,956,224	$66,492,016	$86,052,238	$37,123,378	$54,309,821	$243,977,453	$65,696,246	$309,673,699

1910 VALUATION OF RAILROADS, FIXED BY STATE BOARD OF EQUALIZATION.

	Maine Line Mileage.	Value Per Mile.	Sidetracks Mileage.	Value Per Mile.	Valuation Main Line and Sidetracks.	Valuation by Systems.
Wyoming State Line to Huntley Branch of the Chicago, Burlington & Quincy R. R.	101.74	$12,500	28.54	$1,250	$1,307,425	
Toluca Branch of the C., B. & Q. R. R.	85.54	3,000	5.59	300	258,297	$1,565,722
Butte, Anaconda & Pacific	25.30	19,925	50.85	1,992	605,397	
Spurs	19.68	14,000	17.43	1,400	299,922	
Stuart Branch	8.94	2,500	4.48	250	23,470	928,789
Chicago, Milwaukee & Puget Sound Railway, from Eastern Line of State to Butte	517.66	14,000	130.73	1,400	7,430,262	
From Butte to Western Line of State..	214.74	12,000	40.99	1,200	2,626,068	
From Harlowton to Lewistown	62.42	10,000	5.92	1,000	630,120	10,686,450
Great Northern (main line)	691.50	19,925	150.88	1,992	14,078,690	
Havre to Butte Branch	290.77	19,925	82.21	1,992	5,957,354	
Billings Branch	194.53	15,000	34.17	1,500	2,969,205	
Somer's Spur	10.45	5,000	2.48	500	53,490	
Kalispell Branch	15.63	15,000	8.77	1,500	247,605	
Marion Spur	25.36	2,000	1.77	200	51,074	
Barker Branch	10.79	125	None	....	1,348	
Sand Coulee Branch	10.48	10,000	3.90	1,000	108,700	
Neihart Branch	38.34	5,000	3.80	500	193,600	
Mountain View Spur	3.32	8,000	0.74	800	27,152	
Red Mountain Spur	1.47	1,000	None	....	1,470	
Fair Grounds Spur	0.68	500	0.15	50	347	
Fernie Branch	8.86	5,000	1.99	500	45,295	
Shelby and Armington Branch	126.58	12,500	22.03	1,250	1,609,787	
Sweet Grass Branch	36.54	5,000	1.15	500	183,275	25,528,393
Northern Pacific (main line)	647.92	19,925.	370.35	1,992	13,647,543	
Double Track	130.84	23,925		....	3,130,347	
Bitter Root Branch	47.37	15,000	9.56	1,500	724,890	
Bitter Root Branch Extension	16.45	3,000	9.74	300	52,272	
Boulder Branch	7.89	2,500	1.63	250	20,133	
Butte Line	70.90	19,925	33.01	1,992	1,478,438	
Clark's Fork Branch	19.71	10,000	10.02	1,000	207,120	
Coeur d'Alene Branch	110.25	12,000	23.10	1,200	1,350,720	
Elkhorn Branch	20.13	3,000	2.05	300	61,005	
St. Regis Cut-Off	21.87	10,500	4.16	1,050	234,003	
Marysville Branch	12.58	6,000	1.46	600	76,356	
Montana Union Branch	50.73	19,925	23.51	1,992	1,057,627	
Butte Hill Spur	8.66	6,000	6.67	600	55,962	
Park Branch	54.26	10,000	8.31	1,000	550,910	
Philipsburg Branch	25.94	5,200	4.12	520	137,030	
Pony Branch	6.35	6,000	0.40	600	40,140	
Red Bluff Branch	20.99	5,000	2.50	500	106,200	
Red Mountain Branch	16.51	1,500	4.48	150	25,437	
Rocky Fork Branch	44.16	15,750	13.93	1,575	717,460	
Gaylord & Ruby Valley	45.73	11,000	5.21	1,100	508,761	
Wickes Branch	3.91	1,500	1.25	150	6,053	
Shield's River Branch	22.90	5,000	2.04	500	115,520	24,303,927
Oregon Short Line Railroad	125.79	19,925	28.79	1,992	2,563,715	
Yellowstone Park Railroad	9.55	10,000	1.56	1,000	97,060	2,660,775
Yellowstone Park Railway	11.00	2,000	0.95	200	22,190	22,190
					$65,696,246	$65,696,246

NUMBER AND RESOURCES OF BANKS.

From the report of the State Examiner the following tables which show the wonderful increase that has taken place in the banking business in Montana from Nov. 27, 1908, to Nov. 10, 1910, are taken. Could there be any surer evidence of the state's progress and its financial stability

Abstract of reports made to the Comptroller of the Currency, showing the condition of the national banks in Montana at the close of business Nov. 27, 1908, and Nov. 10, 1910.

RESOURCES.	Nov. 10, 1910. Number of Banks—56.	Nov. 27, 1908. Number of Banks—42.
Loans and Discounts	$26,349,104.19	$21,930,514.82
Overdrafts	658,915.73	581,741.93
U. S. Bonds	3,740,200.00	3,466,200.00
Premium on U. S. Bonds	12,098.58	36,679.38
Bonds, Securities, etc	2,190,799.35	1,701,737.91
Real Estate, Furniture and Fixtures	1,121,913.28	931,551.55
Due from Banks	9,107,770.98	9,920,650.55
Checks and Cash Items	304,800.77	193,182.36
Cash on Hand	3,487,714.32	3,071,271.49
Redemption Fund	139,272.50	115,680.00
Due from U. S. Treasurer	5,478.95	5,468.00
Totals	$47,118,068.65	$41,954,677.99
LIABILITIES.		
Capital Stock	$ 4,767,850.00	$ 3,790,000.00
Surplus	2,420,276.51	1,706,800.00
Undivided Profits	1,612,679.15	1,461,900.29
National Bank Notes Outstanding	2,734,912.50	2,201,207.50
Due to Banks	2,367,787.03	2,004 215.92
Individual Deposits	32,255,272.02	29,393,831.03
U. S. Deposits	429,307.80	734,621.91
Deposits of U. S. Disbursing Officers	291,360.94	247,068.28
Bonds Borrowed	25,000.00	211,000.00
Bills Payable	203,212.42	198,193.06
Other Liabilities	10,410.28	5,839.00
Totals	$47,118,068.65	$41,954,677.99

AGGREGATE RESOURCES AND LIABILITIES OF THE EIGHTY-NINE STATE BANKS AND TRUST COMPANIES OF MONTANA, NOV. 10, 1910, AND COMPARISON WITH REPORT OF SIXTY-NINE STATE BANKS AND TRUST COMPANIES, NOV. 10, 1910.

RESOURCES.

	Nov. 10, 1910.		Nov. 27, 1908.		Increase.
Loans and Discounts		$18,984,170.37		$14,536,023.15	$4,448,147.22
Overdrafts		1,465,056.28		1,424,805.66	40,250.62
Stocks, Bonds, etc.		2,065,596.61		2,007,643.55	57,953.06
Real Estate, Furniture and Fixtures		1,133,394.20		791,862.24	341,531.96
Due from Banks and Bankers	5,312,670.21		4,123,644.67		
Cash on Hand	2,364,746.77		2,173,465.00		
Checks and Other Cash Items	206,294.84	8,383,711.82	113,385.48	6,410,495.15	1,973,216.67
All Other Resources		35,153.84		31,536.68	3,617.16
Total Resources		$32,067,083.12		$25,202,366.43	
			***Decrease	$153,254.00.	

LIABILITIES.

Capital Stock		$ 4,621,400.00		$ 3,125,000.00	$1,496,400.00
Surplus Fund		1,126,110.00		773,700.00	352,410.00
Undivided Profits		1,385,260.83		964,202.97	421,057.86
Deposits Subject to Check	17,485,009.96		12,783,081.29		
Savings Deposits	5,146,067.44		6,602,130.85		
Due to Banks and Bankers	1,538,344.98	24,169,422.38	1,422,733.82	19,807,945.96	4,361,476.42
Bills Payable		754,000 22		367,373.82	386,626.41
All Other Liabilities		10,889.68		164,143.68	* * *
Total Liabilities		$32,067,083.12		$25,202,366.43	
Average Reserve		34.6%		31%	

AGGREGATE RESOURCES AND LIABILITIES OF THE EIGHTY-NINE STATE BANKS AND TRUST COMPANIES OF MONTANA, NOV. 10, 1910, AND COMPARISON WITH REPORT OF SIXTY-NINE STATE BANKS AND TRUST COMPANIES, NOV. 16, 1909.

RESOURCES.

	Nov. 10, 1910.		Nov. 16, 1909.		Increase.
Loans and Discounts		$18,984,170.37		$17,000,948.33	$1,983,222.04
Overdrafts		1,465,056.28		1,370,975.89	94,080.39
Stocks, Bonds, etc.		2,065,596.61		2,298,388.47	* * *
Real Estate, Furniture and Fixtures	5,812,670.21			912,992.98	220,401.22
Due from Banks and Bankers		1,133,394.20	5,344,879.98		
Cash on Hand	2,364,746.77		2,394,592.82		
Checks and Other Cash Items	206,294.84	8,383,711 82	264,442.71	8,003,915.51	379,796.31
All Other Resources		35,153.84		13,833.39	21,320.45
Total Resources		$32,067,083.12		$29,601,054.57	
			*** Decrease	$232,791.86.	

LIABILITIES.

Capital Stock		$ 4,621,400.00		$ 3,550,000.00	$1,071,400.00
Surplus Fund		1,126,110.00		904,050.00	222,060.00
Undivided Profits		1,385,260.83		1,112,009.10	273,251.73
Deposits Subject to Check	17,485,009.96		17,073,618.76		
Savings Deposits	5,146,067.44		5,066,983.04		
Due to Banks and Bankers	1,538,344.98	24,169,422.38	1,622,463.55	23,763,065.35	406,357.03
Bills Payable		754,000.23		262,250.00	491,750.23
All Other Liabilities		10,889 68		9,680.12	1,209.56
Total Liabilities		$32,067,083.12		$29,601,054.57	
Average Reserve		34.6%		33%	

NEW BANKS AND INCREASE BETWEEN SEPT. 1, 1910, AND NOV. 10, 1910.

New Banks.	Capital.	Increase in Capital Stock.	
Conrad Trust & Savings Bank, Helena	$177,200 00	First State Bank, Chester	$ 9,200.00
Benton State Bank, Benton	125,000.00		
Southern Montana Bank, Ennis	25,000.00	Converted to National Banks.	
Lewistown State Bank, Lewistown	50,000.00	Carbon County Bank	50,000.00
Milk River Valley Bank, Glasgow	30,000.00	Flathead Valley State Bank	25,000.00
Total	$407,200.00	Total	$75,000.00

SEE US GROW.

RECAPITULATION.

Nov. 10, 1910, resources of 56 national banks	$47,118.068.65
Nov. 27, 1908, resources of 42 national banks	41,954,677.99
Increase in two years, 14 national banks	5,163,390.66
Nov. 19, 1910, resources of 89 state banks and trust companies	32,067,083.12
Nov. 27, 1908, resources of 51 state banks and trust companies	25,202,366.43
Increase in two years, 38 state banks and trust companies	6,864,716.69
Total increase in two years, 52 state and national banks	12,028,107.35

TOTAL BANK RESOURCES MORE THAN ONE HUNDRED MILLION.

In addition to the 140 banks reporting resources amounting to $79,185,151.77, there are 77 private bank and trust companies in Montana from which reports have not been received and four of them are among the leading banking institutions in the state.

A report from the private banking houses would show that the banking resources of the state amount to more than $100,000.000.00.

	Balance on Hand Dec. 1, 1908.	Received 1909.	Received 1910.	Total.	Paid Out 1909.	Paid Out 1910.	Balance on Hand Nov. 30, 1910.	Total.
General Fund	$ 92,456.90	$1,188,615.82	$1,316,711.46	$2,597,784.18	$1,203,086.86	$1,355,115.96	$ 39,581.36	$2,597,784.18
State Bounty Fund	17,067.47	36,596.26	37,880.78	91,544.51	44,824.60	28,342.25	18,377.66	91,544.51
Stock Inspector and Detective Fund	13,648.05	22,759.42	26,481.23	62,888.70	25,010.54	28,133.50	9,744.66	62,888.70
Stock Indemnity Fund	3,189.12	5,014.60	10,254.40	18,458.12	4,575.18	12,454.79	1,428.15	18,458.12
Sheep Inspection and Indemnity Fund	6,460.24	10,556.67	10,448.10	27,465.11	8,763.51	7,531.94	11,169.66	27,465.11
Fish and Game Fund	52,083.27	43,007.07	70,029.97	165,120.31	41,486.71	47,830.65	72,802.95	165,120.31
Escheated Estates Fund	14,109.55	111.40	765.17	14,986.12	.....	.....	14,986.12	14,986.12
University Library Fund	1,755.00	1,360.00	1,511.97	4,626.97	1,755.00	1,360.00	1,511.97	4,626.97
Soldiers' Home, United States Aid Fund	9,014.01	8,596.88	8,953.12	26,564.01	12,674.49	7,058.95	6,830.57	26,564.01
Forest Reserve Fund	.....	61,941.46	78,172.37	140,113.83	61,941.46	78,172.37	.....	140,113.83
Carey Land Act Board Fund	.....	13,844.80	4,806.70	18,651.50	11,451.89	4,970.15	2,229.55	18,651.50
State Medical Board Fund	1,427.18	1,950.00	2,200.00	5,577.18	1,207.97	2,285.29	2,084.82	5,577.18
State Law Library Fund	503 07	514.58	1,027.83	2,045.48	810.52	597.70	637.26	2,045.48
State Examiner's Fund	.....	10,188.00	13,274.17	23,462.17	10,188.00	13,274.17	.....	23,462.17
State Bond Fund	.....	387,520.37	69,414.99	456,935.36	383,936.95	68,040.00	4,958.41	456,935.36
State Depository Interest Fund	.....	11,697.60	19,854.43	31,552.03	11,697.60	19,854.43	.....	31,552.03
State Engineer's Expense Fund	.....	7,637.00	.....	7,637.00	2,431.85	3,715.60	1,489.55	7,637.00
State Land Office Expense Fund	.....	2,404.10	5,750.40	8,154.50	5 00	13.00	8,136.50	8,154.50
Agricultural College Permanent Fund	42,405.63	102,012.62	18,307.94	162,726.19	130,785.70	140.00	31,800.49	162,726.19
Agricultural College Permanent Fund (Morrill Act)	.....	8,419.72	24,420.00	32,839.72	.....	3,265.50	29,574.22	32,839.72
Agricultural College Interest and Income Fund	3,500.39	16,097.73	22,942.61	42,540.64	12,633.05	26,112.36	3,795.23	42,540.64
Agricultural College, United States Aid Fund	.....	40,000.00	45,000.00	85,000.00	40,000.60	45,000.00	.....	85,000.00
Capitol Building Interest and Sinking Fund	71,974.29	72,244.87	73,738.22	217,957.38	122,034.78	70,267.55	25,655.05	217,957.38
Capitol Building Bond Fund, Second Issue	.....	100,000.00	202,744.25	302,744.25	74,657.59	213,759.44	14,327.22	302,744.25
Common School Permanent Fund	46,575.22	281,075.15	400,825.96	728,476.33	196,266.30	415,584.15	116,625.88	728,476.33
Common School Interest and Income Fund	46,329.97	535,686.74	594,272.54	1,176,289.25	557,999 47	517,408.69	100,881.09	1,176,289.25
Deaf and Dumb Asylum Permanent Fund	40,007.70	9,349.05	38,068.80	87,425.55	45,000.00	40,350.00	2,075.55	87,425.55
Deaf and Dumb Asylum Interest and Income Fund	5,828.83	6,173.25	9,429.96	21,432.04	11,205.89	7,182.37	3,043.78	21,432.04
Normal School Permanent Fund	41,077.00	43,779.08	21,303.71	106,159.79	76,200.00	5,000.00	24,959.79	106,159.79
Normal School Interest and Income Fund	7,126.67	18,226.78	22,007.14	47,360.59	10,662.63	32,313.77	3,784.19	47,360.59
Reform School Permanent Fund	9,189.93	20,282.70	1,203.70	30,676.31	28,500.00	30.50	2,145.81	30,676.31
Reform School Interest and Income Fund	8,263.94	5,430.09	6,546.99	20,241.02	8,895.59	10,092.77	1,252.66	20,241.02
School of Mines Permanent Fund	20,840.11	42,182.63	61,199.21	124 221.95	55,000.00	65,455.00	3,766.95	124,221.95
School of Mines Interest and Income Fund	2,606.09	13,856.99	17,459.67	33,922.75	11,275.60	20,690.31	1,956.84	33,922.75
University Permanent Fund	4,693.95	14,658.71	35,092.69	54,445.35	700.90	50,492.00	3,253.35	54,445.35
University Interest and Income Fund	1,983.15	12,025.49	12,380.67	26,389.31	12,788.54	10,596.41	3,004.36	26,389.31
Carey Land Filing Fund	.....	.....	283.00	283.00	.....	.....	283.00	283.00
Cash Balance	$564,116.72	$3,155,817.63	$3,284,764.15	$7,004,698.50	$3,223,452.28	$3,213,091.57	$568,154.65	$7,004,698.50

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